May, 1952

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EDISON ELECTRIC INSTITUTE BULLETIN

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PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

February, 1951-1952

SOURCE AND DISPOSAL OF ENERGY—MONTH OF FEBRUARY

	1952	1951	%
GENERATION* (Net)			
By Fuel Burning Plants	22,074,678,000	20,012,105,000	+10.3
By Water Power Plants	9,461,369,000	8,207,268,000	+15.3
Total Generation	**31,536,047,000**	**28,219,373,000**	**+11.8**
Add—Net Imports Over International Boundaries	153,231,000	114,275,000	+34.1
Less—Company Use	116,534,000	131,376,000	−11.3
Less—Energy Used by Producer	377,848,000	401,508,000	− 5.9
Net Energy for Distribution	**31,194,896,000**	**27,800,764,000**	**+12.2**
Lost and Unaccounted for	2,486,733,000	1,756,605,000	+41.6
Sales to Ultimate Customers	**28,708,163,000**	**26,044,159,000**	**+10.2**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of February 29			
Residential or Domestic	39,444,054	37,777,138	+ 4.4
Rural (Distinct Rural Rates)	1,643,844	1,597,800	+ 2.9
Commercial or Industrial:			
Small Light and Power	5,530,135	5,434,565	+ 1.8
Large Light and Power	246,871	246,790	0.0
Other Customers	162,686	157,564	+ 3.2
Total Ultimate Customers	**47,027,590**	**45,213,857**	**+ 4.0**
KILOWATTHOUR SALES—During Month of February			
Residential or Domestic	7,901,598,000	7,016,971,000	+12.6
Rural (Distinct Rural Rates)	496,034,000	475,889,000	+ 4.2
Commercial or Industrial:			
Small Light and Power	5,048,408,000	4,664,168,000	+ 8.2
Large Light and Power	13,699,750,000	12,375,690,000	+10.7
Street and Highway Lighting	318,396,000	281,268,000	+13.2
Other Public Authorities	721,649,000	661,200,000	+ 9.1
Railways and Railroads:			
Street and Interurban Railways	282,460,000	323,802,000	−12.8
Electrified Steam Railroads	205,044,000	203,508,000	+ 0.8
Interdepartmental	34,824,000	41,663,000	−16.4
Total to Ultimate Customers	**28,708,163,000**	**26,044,159,000**	**+10.2**
Revenue from Ultimate Customers	**$514,575,300**	**$469,373,200**	**+ 9.6**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended February 29			
Kilowatthours per Customer	2,037	1,867	+ 9.1
Average Annual Bill	$57.04	$53.40	+ 6.8
Revenue per Kilowatthour	2.80¢	2.86¢	− 2.1

* By Courtesy of the Federal Power Commission.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 20 MAY, 1952 No. 5

Opportunity Unlimited

By Pressly H. McCance

President, Duquesne Light Company

An address before the American Power Conference, Chicago, Ill., March 26, 1952

THE unparalleled growth of the electrical industry in the last decade or so has been due to a combination of many things. A few of the factors that have influenced the result are the inventive genius of those who have developed new means of putting electricity to work, the skill of the manufacturers in producing utilization equipment and of the distributors and dealers in its marketing, the ability of the utility companies to provide energy in an ever-increasing amount at lower and lower cost to the user, and the willingness of the public to invest its money for the necessary construction of new manufacturing and utility plant.

Acceptance of Living Electrically

The gains that have been made have their roots in the pioneering that was done in earlier years. There was then developed a valuable kinship between the manufacturers, distributors, dealers, contractors, and the electric companies, with each promoting, in their own way, the greater use of electrical equipment and service. As a result of this common effort, a basic acceptance of the benefits of living and working electrically evolved.

In the course of our growth World War II came along, and inflation, with increased labor costs and increased taxes. Labor became scarce and high-priced at a time when top war production was needed. Farm hands left the farms, and household servants priced themselves out of the market because of the availability of high-wage jobs in industry. At the same time that industry turned to greater mechanization as a means of maximum production with the lowest possible labor costs, farmers and housewives turned to electrical equipment and appliances to fill the gaps and get the necessary work done. These changes, enforced to a great degree, demonstrated the value of electricity as an industrial, farm, and household servant as never before.

Think for a moment of your own home, or of the majority of those around you. The day of the domestic servant is done. Housewives or householders can no longer afford full-time maids. The cost of day workers has increased. This has accelerated the purchase and use of labor- and time-saving electrical appliances and equipment. The automatic washer and clothes dryer are good examples. The connected load or demand in the modern small home of today is equal to that of a good-sized store or shop of a few years ago.

The ability of the electric industry to deliver electric service to residential customers at a consistently lower price per kilowatthour during a period of higher and higher costs has stimulated the desire and willingness of people to electrify housework and chores. Less and less attention is being paid to the added kilowatthours or added cost as represented in monthly bills. People know by now that electric service is the biggest bargain in the family budget.

In similar fashion, electric service is taking the place, permanently, of many of the people who were previously available for farm chores, or for work in industrial plants. It has been amply demonstrated that electricity is the most able and most profitable hired hand or tool that is available in agriculture and commerce. It is enabling more and better work on the farm, and a higher production output per man in industry.

This is an electric and an electronic and an atomic age. Things inconceivable or thought to be impossible a few years ago are in the accepted category today. New discoveries, inventions, or methods that involve a further use of electric service are being announced or made known to us with increasing frequency. They are so frequent as to be commonplace unless of very major significance. Huge industries have been created in a few years by a single discovery or development, as for instance, television.

Industry Record

Let's remember that the electric industry is about 75 years old; then let's take a look at the record for the last few years:

During the ten-year period, 1942-1951

Number of customers increased	47%
Gross revenues increased	75%
Sales of kilowatthours increased	100%
Residential use per customer increased almost	100%
Average residential price per kilowatt hour decreased	22%

The 10th Semi-Annual Electric Power Survey made by the Edison Electric Institute shows that generating capability increases, as scheduled by the nation's electric power systems, would result in total capability of 104 million kilowatts by the end of 1954. This, compared with about 48 million kilowatts installed at the end of 1941, represents an increase of 117 per cent in the 13-year period, 1942-1954. These figures do not take into account the increased diversity value of the added capacity, either within or between specific power companies, systems, or pool areas.

It was said a few months ago by a writer for *The New York Times* that

". . . the magnitude of the electrical companies' expansion program has never been approached by any other industry." In this connection, the Department of Commerce of the Federal government is authority for the statement that since 1947 about 14 per cent of all industrial plant and equipment expenditures have been made by the electric utility industry.

In this connection I would like to call attention to a finding of the DEPA study of the load and capacity situation, dated December 31, 1951, which reads as follows:

> That the program of total generating capacity now on order be accepted and approved (by DEPA) as a minimum, even though for the years 1953 and 1954 it shows capability to carry more load than forecast by the utilities. DEPA confidently believes that not only are the utilities' forecasts conservative, but that new and important loads, not now precise as to time and place, will be realities in 1953 and 1954 in amounts which will more than use up the presently indicated spread between minimum capacity requirements and the total capability as scheduled under the present program.

This study, as you know, was made by the Electric Power Advisory Committee, headed by Edward W. Morehouse of General Public Utilities Corp.

So much for the present and the near future. Let's take a look now at the long-term prospects for the industry, although we do so with a recognition of the difficulties of long-term forecasting.

Long-Term Prospects

Ebasco Services, in December, 1951, developed a series of charts and graphs to indicate certain economic trends and developments. They show that per capita generation of electricity in the U. S., including self generation by industrial plants, increased from 217 kilowatthours in 1910, to 528 in 1920, to 959 in 1930, to 1,363 in 1940, and to an estimated 2,851 in 1951. Per capita use increased 109 per cent from 1940 to 1951. As to the future, a well-known manufacturing organization (General Electric) has forecasted a probable 4,197 kilowatthours and a maximum 4,527 kilowatthours per capita in 1960.

As to electric company capacity, another company (Westinghouse) has forecasted 138 million kilowatts in 1960 and 178 million kilowatts in 1965. Other forecasts are even higher for the next two years. If the more conservative of these two forecasts is realized, it means that the generating capacity of the industry will double in the present decade, and that it will increase to two and one-half times its 1950 size by 1965. One of these companies is authority for a recent statement that the electrical industry is growing three times faster than industry generally.

"Opportunity Unlimited" does lie ahead, and we can look forward to a much larger industry in the future, provided that we recognize and are prepared to deal with the possible dangers and pitfalls that can cross the path of anticipated growth. It can be opportunity for success, or it can be opportunity for failure.

Mere size is not the measure of success, unless greater size and growth are accompanied by a sound development of the business and long-term operating results that assure an adequate return upon invested capital. Although the very character of the electrical industry is such as to give it greater financial stability, there are, nevertheless, inherent risks in the business which entitle the companies to make a commensurate profit from which a proper return may be made to investors for the use of their money. We will have failed in our future growth if we merely trade dollars.

Development of New Business

With all due credit to those responsible for our present size and position, it must be admitted that a goodly portion of the new business enjoyed by the electrical industry in recent years has developed in spite of, and not because of, our sales promotion effort. Our businesses are, of course, larger than they would have been without aggressive selling, but it must be recognized that rapid technological advances and changing economic conditions have produced a natural turn toward the greater use of service that would not otherwise have been the case. Therein lies a challenge. For if we do not adequately anticipate our prospective growth, we will add grist to the mill of the proponents of public power and those determined to nationalize the electric utility industry. If we estimate too high, and overbuild, we will create difficulties that will make us vulnerable both from within and without.

We cannot assume that the present methods of generating, transmitting, and distributing electrical energy will continue without change. Who knows but that tomorrow announcement will be made of an industry-shaking, new, better, and less costly method of generating electric energy? Or of transmitting it or distributing it? Who knows but that some new electric use or process will be discovered that will create demands of undreamed of magnitude, or that some new principle may be found that will destroy a substantial part of our market? Is there a plateau of near-saturation in the future as we are viewing it, and if so, when do we reach it?

Hard Work Ahead

Although all present indications point to a very substantial growth of the electrical industry, situations will develop which will test the mettle of those making their livelihood from it. There is no place for smugness on the part of any of us. Quite the contrary. There is plenty of work—hard work—to be done by the people and companies which comprise the electric industry.

We are going to need more people than we now have, which means that we must look ahead very carefully as to the sources of new personnel—engineers, salesmen, accountants, linemen, substation and power station operators, and in fact, people for almost every job classification. The growth that we see ahead will require major changes in our organizations—upgrading, training, job orientation, realignments of work and responsibility, etc.

The industry will have to obtain vast sums of new money to buy the equipment and to build and operate the tremendously larger physical plant that will be necessary in the next 10 or 15 years. This means that our operating results must be such as to readily attract new money at a fair and reasonable cost, which is presently on the ascendancy.

Rates for service must at all times be adequate in relation to revenues, operating costs, and net income. Necessary rate increases must be anticipated by the managements of electric companies, and rate filings must be made that will take into account the appreciable time lag that there can be between rate filings and rate relief. This is particularly necessary in periods of inflation or rising costs, to protect the owners of these businesses against a period of subnormal earnings and impairment of the ability to attract needed new money for the enlargement of physical plant.

We are going to have to continue our selling effort, without let-up, to insure the addition of load building equipment and the highest possible degree of service

utilization in all markets. Our planning and engineering must be thorough, far-seeing, and well in advance of need. We must be prepared to take such calculated risks as are necessary to insure service adequacy and reliability. We must be on a constant search for every means of efficiency and economy of operation.

This country has grown great, greater than any other country in the world, because of the truly democratic principles and processes upon which it was founded. Its keystone is freedom. Freedom of the individual and freedom of individuals to pool their resources and band together in the promotion and development of a lawful cause or project. Freedom to earn more money than their neighbors, and to save more money than their neighbors. Freedom to risk their savings in a venture that might return more money or result in the loss of their money. In a word, free enterprise, unhampered by the do's and don'ts of a paternal government, and unrestricted by the intrusion of government, be it Federal, state or local, into the fields of commerce where experience has shown or indicated that the same job can be done as well or better by private enterprise.

Freedoms Threatened

Our freedoms are being threatened more and more each day. For a number of years, we in the electric industry have challenged the right of the Federal government to engage in the power business. We have opposed the construction of government power projects. We have branded as unwarranted and improper the use of Federal funds, obtainable only as taxes from our companies and from us as individuals, for tax-free dams and electric plants and lines in various remote corners of the land. We have emphasized that such use of Federal funds reduces the tax base, and that taxpayers from all over the country not only pay for government projects but are thus required to make up the taxes lost because of such projects. Few taxpayers will ever benefit from most of the government projects that have been built or are being built, even though every American taxpayer is required to help pay for them.

In this respect there is a noticeable lack of industry unanimity in opposition to public power and other matters inimical to the progress of private or free enterprise power. To be most effective there should be a single, concerted, and all-inclusive voice that would make itself heard with great force and determination when projects are advanced that we know are un-American and against the public interest. Perhaps it is because this industry is so relatively young that it has not had time to see a consolidated position evolve on economic and political matters. Our effort is now a divided and to some degree a shotgun type of approach. It would be decidedly beneficial to every company and every person in this industry if the small differences and difficulties that appear to stand in the way could be resolved and a solid and united front presented to those who would break through our ranks.

Niagara River Project

The Niagara River project, and I do not mean the St. Lawrence Seaway, which is a separate project, is an excellent example of the threat that hangs over us. Five tax-paying, business-managed, electric companies in New York State are ready and willing to spend $350,000,000 on the installation of generating plants and associated property to develop well over a million kilowatts of additional capacity on this stream. They can build the plants and lines and start operation of the first stage of development in three years. After completion of the project these companies estimate that they will pay $23,000,000 a year in Federal, state, and local taxes.

Three bills are now before Congress, one to permit state, one Federal, and one private enterprise construction and operation of the facilities. The Army engineers are credited with having reported in Congressional hearings that it would take them five years to build and make the first stage operative. As to the cost to the taxpayers if built by the government, I will let you be the judge of the demands that would be made on the Federal treasury. And once completed, the project would pay no taxes, except perhaps some insignificant token sums "in lieu of taxes."

The Niagara River development is pure power. There is no flood control or navigation involved. It is a clear, clean, open-and-shut question of government vs. private enterprise power. Is our tax money to be used to build the facilities and dispose of the energy on a preference basis to further socialize the provision of electric service? Or will private enterprise be permitted to build and operate them with private capital, with regulated operation and rates, non-discriminatory distribution of energy, and a proper tax return to the Federal government, the State of New York, and to local taxing bodies?

This is but one of the threats to private enterprise, and the challenge is down. It is vital to every one of the tax-paying, business-managed electric light and power companies in the country, not alone to the five New York State companies. And it is vital to all other industries as well, for if it can happen to the electric industry, it can happen to any industry. That is the trend today, and if it is not stopped we are going inexorably to socialism and national bankruptcy, just as England did.

I think you know of the tremendous amount of money that President Truman is asking Congress to approve for Federal electric power development in the coming fiscal year. He is asking for $855 million, but as the *Wall Street Journal* points out in an editorial entitled "The New Queensberry Rules," in its issue of March 4, no one can be sure that this fully states the government's power program for fiscal 1953, for some, if not all, of the several power authorities are free to apply earnings to construction.

The editorial discusses the TVA and says that ". . . in no way did Congress authorize TVA to make the generation of electric power for sale its major purpose." In regard to this statement, I would like to refer again to the Ebasco charts, which show that shortly after 1955, TVA capacity will be 68 per cent steam and 32 per cent hydro. TVA's total capacity will then be almost 8½ million kilowatts, exclusive of Alcoa and Army engineers projects in the TVA system—by far the biggest power system in the country. Ebasco says, and properly so, that, "In the next few years TVA will become a steam electric system, with hydro for peaking purposes." This is certainly far afield from the original concept of TVA and its basis for being.

Competition for Public Favor

Returning to the *Wall Street Journal* editorial, it concludes as follows: "But TVA, though it sets the pattern, by no means tells the whole story of the growth of public ownership power in the U. S. Thus, the Rural Electrification Administration, as the Presidential budget proposes, would receive $215 million for the coming fiscal year in the form of 'authorization to expend from public debt receipts.' The lusty Bonneville Power Administration is to receive $59 million; the relatively young Southwestern Power Administration is to get not quite $8

million to keep it nourished; the embryo Southeastern Power Administration is allowed a measly $795,000. By contrast, the very active Bureau of Reclamation of the Interior Department is a candidate for $225 million earmarked 'Construction and Rehabilitation.'

"Whether or not you take seriously the reiterated assertion of the TVA that it is forced by considerations of national security to build steam-electric plants as fast as it can, or the recurrent alarms of public power propagandists over an impending and disastrous power shortage, there is one fact you cannot miss. Public power is competing with private ownership power for the people's favor. In this struggle the former has the immeasurable advantages of governmentally supplied capital and the privilege of paying 'in lieu of taxes' whatever it chooses to pay.

"What do you think the result of a prize fight is likely to be if one of the pugilists has one of his wrists lashed behind his back? And if the Queensberry rules are modified to allow that to be done in one contest, how many others will be "fixed" with the referee's connivance?"

This quotation from one of the country's leading financial newspapers needs no elaboration. It tells the story of government power very well. It indicates the need for a change, and soon.

Rising Taxes

It has been estimated that more than 23 cents of every dollar paid by customers for electric service in 1951 was remitted by the electric companies to Federal, state, or local governments to satisfy taxes levied upon the companies. That means that almost 2½ million dollars ($2,341,000) of every 10 million dollars of gross revenue has to be paid out in taxes. The corporate Federal income tax rate is now 52 per cent, to say nothing about Federal excess profits taxes. How much higher can taxes go without becoming confiscatory? Even though the 3⅓ per cent electrical energy tax was eliminated last November, increased taxes have been a major factor in the inability of the electric companies to produce a satisfactory net result in relation to rapidly increasing capital investment. The rising trend of taxes must be stopped.

There is another angle to the tax question. It is estimated that the Federal, state, and local taxes paid by the electric companies in 1951 were $1,164 million (an amount equal to 1.37 per cent of the $85 billion that Mr. Truman is asking of Congress for fiscal 1953). Eleven hundred and sixty-four million dollars! This is the tax income that the public power proponents threaten to destroy every time they propose the further intrusion of government into business.

Greater Problems—Greater Opportunities

Our problems are becoming more complicated, more serious, and more numerous as our systems continue to grow. No longer can we concern ourselves with only the geographical limits of our own service area. No longer can we view distance as insulation from a threat, real or implied.

Meanwhile, and in spite of our problems, which I prefer to view as growing pains, we are going on, surely and permanently, to higher and higher accomplishments. I think that we will build on the opportunities that lie ahead for success, and that we will watch for and avoid the opportunities for failure. I am thoroughly sold on the ability of the people of this industry to come to grips with a problem and to solve it. My only question is whether or not we will see the problem soon enough to act concertedly, when necessary.

When I think of the great growth of the electric industry that is predicted by 1960 or 1965, I begin to wonder what it will be by 1980 or by the year 2000. By the law of averages, some of the people presently in the industry will still be turning out kilowatthours, possibly with atomic energy. Whatever the result, I am sure that we can all look ahead with genuine optimism to a growth that would surprise and astound us today.

We are going to be making and selling electrical energy, whether it be generated from coal, falling water, or atomic energy, for a long time to come. And we are going to make and sell greater and greater amounts of it as the years unfold. Nothing, short of a national catastrophe, can stop the growth and development of this great industry. There is "Opportunity Unlimited" ahead.

Utility Management Workshop to be Held at Columbia University in August

INVITING the participation of executives of electric, gas, telephone, and water utilities, a Utility Management Workshop will be held at Arden House on Columbia University's Harriman Campus in Harriman, N. Y., August 18-30. Under direction of Columbia's department of industrial engineering, the workshop sessions will be concerned with the development of administrative and executive talent within the utility fields and will concentrate on the questions:

1. What is the job of the utility executive, and what does it take to fill it?
2. What training programs are available and suitable for development of executives?

A program has been arranged with the assistance of an informal group of utility officers, and workshop participants will have an opportunity to formulate answers to the above questions with the cooperation of the Columbia Research and Conference staff and outstanding experts from other industries. The workshop group will be limited to 45 participants, and attendance will be restricted to no more than two persons from a single company.

Participants will be organized into task forces of from 12 to 15 members, who will remain together during the course of the workshop and will be assigned an experience group leader, a research assistant, and a secretary. The task forces will work in individual research and study sessions and in joint meetings, where there will be both presentations and discussion. Within the task forces, teams of two or three members will be assigned the analysis of specific problems, tailored to suit the individual needs of participants, for presentation at joint task force meetings. Group proceedings will be recorded, minutes made available, and edited material published upon conclusion of the conference.

A detailed description of the workshop program along with application forms may be obtained from Robert Teviot Livingston, Professor of Industrial Engineering and Workshop Director, 409 Engineering Building, Columbia University, New York 27, N. Y.

Federal Power in the Missouri Valley

By N. B. Gussett
President, Iowa Power & Light Company

An address before the American Power Conference, Chicago, Ill., March 26, 1952

BASICALLY, this country of ours has been for generations a nation of men and women who scrimped and saved and planned within family or business boundaries of less than national scope. Those who planned well, prospered. Those who planned badly, suffered the inevitable consequences. The good planners exceeded the bad and the nation rose to heights of wealth and prosperity and social consciousness and happiness and freedom never before experienced by any other country.

However, depressions, great wars, and an ever growing population seemingly produced a fear that economic insecurity would result from a continuation of citizen-responsibility planning. As a result, the American people have during the past few decades tended more and more toward surrendering their planning function to the graspingly ambitious central authority of the Federal government.

Those receiving this great responsibility have unquestionably planned in the grand manner. There are many citizens who feel that all of the details have not been in accordance with the beliefs of the great founders, but it cannot be denied that plans in abundance have been prepared.

Success of Federal Planners

Neither can it be denied that acting in climates of depression and of war and, yes, of prosperity, those interested in placing their plans in effect with the maximum of speed have made much progress, sometimes apparently in total disregard of unbalanced budgets, grievously increased taxes, and an astronomical national debt. In fact, they have gone so far that many citizens are beginning to wonder if the economy has not been dangerously strained and if the timing and wisdom of further spending should not be reviewed before we arrive at a fiscal situation which verges on disaster.

Some of the most ambitious of this Federal planning has to do with the development of the Missouri Valley. Since that planning affects one-sixth of the land area of our nation, since it commits the taxpayer to the eventual expenditure of many, many billions of dollars, since it arbitrarily assumes that centralized planning is more effective than the citizen-responsibility planning upon which we have based the progress of the past, and since, in many respects, it tends to further curb the rights of the individual and of established units of local government, it should be of interest and deep concern to all.

It is improbable that any thinking citizen would oppose the expenditure of reasonable sums in connection with planning, as such, to determine upon the control and beneficial use of the water of the Missouri Valley or upon the conservation of its irreplaceable soil. However, it is believed to be the right and, in fact, the duty of every American citizen to withhold his approval of any plans until he is convinced that the projects are economically justified and that the amounts of money scheduled to implement them are not so enormous as to have an unhappy effect upon our nation. We should not, as has so often been done, completely delegate the decisions in such a matter but should, ourselves, make the checks and crosschecks which are our obligation and our right as citizens.

By making these audits, we are not necessarily questioning or challenging the forthrightness of those who serve under orders and in the performance of assigned tasks or of those who are over-inspired by professional zeal or of those who fail without evil intent to pause long enough to consider the ultimate effect of their contribution toward eventual ends which may be contrary to the best interests of our country. We merely express by our audits a natural caution as to whether it is within the ability of any centralized group to plan properly so enormous a project.

I feel very strongly that it is not, and I most vigorously oppose the setting up of a Missouri Valley Authority or any other authority which will attempt such planning or which will in the slightest measure circumvent or destroy the rights and powers of the states of the Missouri Valley. We wonder if this is the time to continue to depart from the proven virtues of citizen-responsibility planning. We question our ability as a nation to shoulder still greater tax and financial burdens for projects which cannot meet the test of economic justification.

The Missouri Valley project, as now envisioned by certain high-level planners of several major departments of the Federal government, anticipates the expenditure of taxes in excess of seven billion dollars. In view of the present national debt, of projected defense budgets which stagger the imagination, and of tax burdens which are beginning to adversely affect our standard of living, it behooves us to pause before attempting to shoulder this extra load.

There are other reasons why we should not heedlessly rush forward on this particular path before we take an extended look. Not the least of these is the unquestioned inclusion by certain planners of methods and devices and procedures which will assure the continuation of planning at their level and the impositions of controls and authorities which will disregard state lines and state rights and the duties and responsibilities which we have seen proper to assign to our duly elected state and local officials.

Public Examination of Federal Schemes

Because of space limitations, it is impossible for me to touch upon all of the elements of current Missouri Valley planning. They affect, in one way or another, just about every phase of American life. I would suggest, however, that each individual unit of our society, each political subdivision, each state, each county, each municipality, each water and school and road district, each business group, each taxpayers association, each Chamber of Commerce, organized labor, farmers, and merchants demand that this planning in its entirety be brought into the open and made available to them.

They will find that many units of the Federal government have prepared, are preparing, and propose to continue to prepare Missouri Valley plans. Some of these, I hope, they will look upon with favor, as for instance, many important

measures designed to hold the rainfall where it falls and thus to contribute to soil conservation. Others, I hope, they will look upon with disfavor, as for instance, plans with expressed aims which are by no means the true aims and plans, which are entirely beyond the ability of any small group of centralized planners to prepare.

These investigative, these rightfully curious groups of governors and mayors and businessmen and farmers and representatives of labor, will find that the plan of the Department of the Interior is the most far reaching of those which have partially come to light. However, I believe that they will find to their surprise that even this plan, the preparation of which has already cost untold millions, is most general in nature, is certainly not in the detail that would seem to support the final conclusion that billions should be spent over a period of years, and is open to question as to whether or not it justifies the millions which have been spent and are being spent, particularly upon big multi-purpose dams on the Missouri River.

I do not know what they will find, and I do not know what they will conclude. However, as regards one element of the Interior Department plan, an element which has a decided bearing upon the future of the American free-enterprise system, that is, the generation and transmission and sale of electric power in the Missouri Valley by the Federal government, I have some conclusions and a suggestion which may be of interest.

Faith in Free Enterprise

My conclusions are, I hope, without bias, except as they may be influenced by my abiding faith in our system of free enterprise. My interest in this subject is understandably stimulated by the character of the industry with which I am associated. The investor-owned electric companies have a real and long-range interest in the areas they serve and in the development and conservation of natural resources. They support plans believed capable of fulfilling worthwhile promises made to the taxpayer, but due to their technical nature as utilities, they could well be considered derelict in their duty did they not point out any projects which they consider unnecessary and wasteful.

There is no question but that the Federal government will generate and sell considerable hydroelectric power in connection with the hundreds of millions of dollars which have been spent, are being spent, and are planned to be spent on large dams in the Missouri watershed.

However, I do not believe that any comprehensive, detailed over-all plans for the most advantageous utilization of this hydroelectric power have ever been prepared. There is no question but that the Department of the Interior, charged under present law with the disposal of this hydropower, has made extensive plans for supplying certain "preference customers." However, I seriously doubt if such plans offer promise of more than minimum advantage to the United States Treasury, since, among other things, they obviously are not based on extensive investigations regarding integration with existing thermal-electric plants or the use of transmission facilities of existing electric systems for the delivery of this power.

Plans of Minimum Advantage

I have referred to such plans as plans of minimum advantage because they decidedly would not achieve for the taxpayers the maximum advantage which may rightfully be expected. These taxpayers, especially those who reside in states far removed from the Missouri Valley, cannot hope ever to see the U. S. Treasury receive a return which will begin to approach the rewards which they, the taxpayers, might have gotten had they been permitted to retain their savings and to invest them in homes and stores and factories and farms according to the American tradition, instead of having them taken in the form of Federal taxes.

However, since it is the taxpayers' money that has been and is being spent, I believe it is quite reasonable for them to ask, and, in fact, to require that the agencies of government, which are operating the facilities, the construction of which has been approved by Congress, do so in such manner as to bring in the maximum return.

The one and only way to achieve this end in the Missouri Valley is to correlate the hydroelectric developments of the Federal government with the great thermal-electric generating facilities of the investor-owned electric companies and with the transmission and distribution networks which presently serve the great majority of the citizens of the Valley.

If this is not done, then these will be some of the inevitably bad results:

1. Millions will be wasted on unnecessary and duplicative transmission facilities.

2. Communities and whcle areas will find to their dismay that long radial transmission lines from distant dam sites lack the dependability that is required of modern electric service.

3. There will continue to be much generalized talk, not based on published and accepted findings of admittedly unprejudiced engineers, as to the "large" quantities of power which will come from the hydro developments. As a result, such firm, dependable, year-in and year-out capability as the hydroelectric units may eventually be found to possess will be overestimated and oversold in advance. Rationing and brown-outs and other inconveniences will follow during the dry periods that will come in the future, as they have in the past, to the Missouri Valley. Incidentally, I have reason to believe that the amounts of dependable, firm power which will result from these Federal Missouri Valley developments will be surprisingly small, so small, in fact, that they will be of relatively little assistance to the Nebraska electric systems, the municipal electric systems, the REA's, and the investor-owned electric companies in meeting the electric demands of the future. However, there is no occasion for alarm, for if the past is any guide to the future, you can be assured that those demands will be met, as they have in the past, by existing service groups. No power shortages will be experienced, rates will be at such low levels as will attract industry to our Valley, and all this without the paternalistic assistance of the Federal government.

4. There will continue to be much loose and misleading propaganda about "cheap power." On the basis of engineering data resulting from a preliminary study made by a nationally known firm of engineers, I am inclined to believe that when, if ever, the construction and operating cost figures of these Missouri Valley projects are subjected to the merciless light of publicity and to unbiased analysis, the resulting power costs will be found surprisingly high.

5. The hydroelectric units will be operated to very poor advantage, depending to a great extent upon the whims of the Missouri River and its tributaries. These are streams of feast and famine, of flood and trickle, and man can do little about the amounts of water they receive.

If this correlation of the hydroelectric developments of the Federal government and of the great thermal-electric generating and transmission facilities of the

investor-owned electric companies is worked out, then these will be some of the good results:

1. Best use will be made of transmission facilities and there will be no unnecessary and wasteful duplication.

2. Thermal-electric plants of existing service agencies will, in numerous instances, have the effect of making another power source available to those customers who otherwise would depend upon long transmission lines from the dams.

3. The actual amount of hydropower, firm and dump, that will be developed at each hydro site under various conditions of flow will be determined to the satisfaction of all concerned and published so that all may know what to expect under all conditions.

4. There will be a better understanding as to how the Federal authority, legally charged with the determination of wholesale electric rates adequate to support these tax expenditures, has arrived at them, this especially in view of the fact that the dams and hydroelectric and transmission facilities have cost and are costing far more than originally anticipated.

As an aside and in view of these increased expenditures, it is to be presumed that such wholesale rates as have been announced will certainly be reviewed by those made responsible for the returns from these enormous expenditures. At a time when every citizen is feeling the increasingly heavy burden of Federal taxes, it is reasonable to expect that taxpayers in states far distant from the Missouri Valley may wish to be assured that they are not subsidizing Missouri Valley citizens who each day are coming in more direct competition with them from angles of agriculture and industry.

5. The hydroelectric units will be operated to very best advantage with water stored behind the dams during off-peak hours and poured down through the wheels at time of peak. This arrangement will be a particular benefit during times of drought.

This correlation, this integration, can be worked out by proper utilization of thermal-electric plants which already exist and which plants could easily carry the off-peak loads of the foreseeable future while the hydros store the water. Large thermal-electric units of the investor-owned electric companies now under construction, on order, or planned will make this statement doubly true before any substantial portion of the new main-stem hydro units are in operation.

There are those who feel that many of the unquestionably fine executives and engineers and technicians of the Department of the Interior are being directed to proceed along lines of non-cooperation with investor-owned electric companies, this with the idea of the eventual nationalization of the entire electric industry. There are others who feel that the executives of many investor-owned electric utilities would never be able to work in complete cooperation with any official representing the power interests of the Federal government. Therefore, an impasse might appear to exist. However, I do not think that this is by any means the case. Already we see evidence that an accord has apparently been reached between the Southwest Power Administration of the Department of the Interior and twelve investor-owned electric companies of the Southwest.

There are men of wisdom, men of good sense and judgment, men of fairness, and men who believe in traditional American principles on both sides. In fact, there are so many men on each side whose lives and futures are dedicated to a continuation of the American way of life that I am emboldened to suggest to the Secretary of the Interior, in view of the potential advantages of the integration of the hydroelectric developments of the Federal government with the thermal-electric plants and systems of the investor-owned electric companies of the Missouri Valley, that he invite representatives of those companies to meet with him for the purpose of attempting to solve this problem.

I certainly do not pose as a representative of all of the investor-owned electric companies in the Missouri Valley. However, it is my opinion that many of them would accept such an invitation.

Objection may be raised that I apparently have not given consideration to the interests of the municipally-owned electric systems and the REA-financed cooperatives. Such is by no means the case. Their interests are of great importance. There is no question but that they, too, have thermal-electric plants and distribution systems, but in general they are of the smaller sizes and any practicable correlations seemingly should be approached after the basic integration problem had been solved. How and when the problem would be solved for the public power organizations of Nebraska will necessarily rest upon decisions of their officials and the Department of the Interior.

I make this suggestion with the hope that it will initiate procedures which will eventually work out for the good of all users of electricity in the Missouri Valley and for the good of the burdened taxpayers of the nation. Also, that it will serve as a foundation stone upon which we can begin again to build that confidence between the government and a substantial segment of its people which is so necessary to our continued survival in a world of danger and unrest.

Ceremonies Mark Fifty Per Cent Home Ownership of Wisconsin Power and Light Co.

MARKING the attainment of more than 50 per cent home ownership by the Wisconsin Power and Light Co., ceremonies conducted recently in Sheboygan gave special recognition to a high-school youth, whose purchase of five shares of common stock was responsible for this achievement.

The ceremonies, which were highlighted by formal presentation of a stock certificate to 15-year-old Dick Nack by M. H. Frank, Wisconsin Power and Light Executive Vice President, consisted of a full day of activities during which Dick and his parents, Mr. and Mrs. Wilbert Nack, were guests of the company and which included dinner at the Grand Hotel and an inspection tour of the company's local properties.

A freshman at Sheboygan North High School, Dick purchased the stock from money he had saved during past years as a carrier for the *Sheboygan Press*, and his decision to become a stockholder was entirely his own. In a radio interview with Dick over Station WHBL, Mr. Frank briefly described the company's service area and facilities and explained that Dick had acquired an equity in all of this property through his purchase.

Other guests of the company at the ceremonies were Burton and Robert Scheele and David and Peter Daane, high school and grade school students who also recently joined Wisconsin Power and Light as stockholders.

Swivel Chairs for Sale

By E. P. Werley

Commercial Sales Manager, Pennsylvania Power & Light Company

An address before the 18th Annual EEI Sales Conference, Chicago, Ill., April 1, 1952

THE title of this article would seem to indicate that I am in the furniture business, but that is not the case at all. The truth of the matter is that with a really aggressive selling program for commercial cooking, we in my company have found that we have no time to sit around and, consequently, have no use for our old swivel chairs. So we have them for sale.

Because PP&L won the 1950 Hughes Award "for outstanding achievement in the promotion of commercial electric cooking," I have been invited to share our secrets. But, there are no secrets. All you have to do is get off your swivel chairs, roll up your sleeves, and go to work.

If a company's management wants additional profitable load — commercial electric cooking load—it can be achieved. Seven per cent or more can be added to a company's total commercial revenue in less than five years. All that is needed is manpower, some sales training, sales tools, a plan for action, and hard work. That's it! The rest of the story is just detail.

Elements of a Good Organization

The first thing needed is an organization—and I won't attempt to mention all of the elements of a good organization. However, there are two I wish to mention briefly. One of them is having a competent and experienced commercial cooking supervisor who knows kitchen planning, equipment, and the problems of volume cooking. He is needed as the special sales assistant to all-purpose salesmen. Secondly, someone is needed to train the customer. We have such a man, who has the title of "commercial service representative," and who we somewhat facetiously say provides the home service to the commercial kitchen. He instructs chefs in the art of cooking electrically. This gets the customer "off on the right foot" and goes a long way toward making him immediately satisfied with his electric equipment and keeping him that way.

Then *trained* salesmen are needed. PP&L has little better than one sales representative per 100 food service customers. These are all-purpose representatives, who spend from one-fourth to one-third of their time promoting commercial cooking. These men must be given thorough initial training and adequate follow-up courses designed to keep them constantly aware of new equipment and new ideas and techniques. We find cooking promotion the toughest part of a sales representative's job. It is the only part of his job that he doesn't know more about than do his customers—as an example, the average representative's superior knowledge in lighting.

Personal Customer Contacts

We emphasized throughout our years' cooking activity the importance of personal customer contacts, and we made thousands of them. In 1950 our salesmen averaged 300 calls per 100 food service customers. These customer contacts were both preceded and followed up with mailings. A total of 366 mailings and hand-out pieces per 100 food service customers were used in 1950. These were in addition to *Food Service News* and the *Fact Book,* which were mailed to 37 per cent (now 58 percent) of our customers.

Another sales medium we stressed was the use of written sales proposals. Eight of these were used per 100 food service customers in 1950. These carried in print, for the customer's future reference, the story of commercial electric cooking and its application in his own operation.

Best Sales Tool

Our best sales tool in terms of immediate results is, and has been for several years, an ample stock of trial-use counter line equipment. We have one piece—a fry kettle, griddle grill, food warmer, or automatic coffee maker—for every 100 food service customers. These pieces of trial-use equipment were put to their maximum use with 15 trial demonstrations for every 100 food service customers during the year. Better than 50 per cent resulted in immediate sales, and over 100 per cent in ultimate sales. The over 100 per cent plus was due to multiple sales in certain establishments. Where a salesman fails in selling the idea of an immediate purchase, he very frequently is successful in selling the idea of trial use. With trial use, the equipment helps sell itself.

A customer spending $700 or $800 for a heavy duty range is mighty interested in seeing the equipment in the flesh, rather than buying from a catalog. Therefore, we feel that displays on company sales floors are important—particularly in areas like ours where few dealers carry any appreciable stock of equipment. Presently, 24 of our district offices display commercial cooking equipment.

Eleven out of every 100 food service customers attended the four Hotpoint Restaurant Round-Ups held in 1950. These mass promotions helped stimulate interest in electric cooking, and many sales were traced directly to these meetings.

Commercial Equipment Shows

But the shows that required the most work—and produced the greatest results proportionately — were the local commercial equipment shows. These really took the sales department out of their swivel chairs. A total of 30 per cent of our food service customers attended these commercial equipment shows sponsored by our sales organization and supported by local dealers, distributors, and manufacturers. Of course, the entire burden of organization was handled by company representatives. The sales personnel hired the hall, needled the exhibitors into "getting into the act," planned the advertising, door prizes, mailed and handed out thousands of announcements and reminder cards, made hundreds of personal calls, did the wiring, assisted in setting up displays, purchased the food, delivered and prepared it for visitors to the show, manned registration desks and company booths or displays, and generally took care of all the details, large and small.

These shows were actually small-scale replicas of the large national hotel and restaurant shows and, believe it or not, were in each case more profitable on the

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Using the Commercial Department to Sell "More Power from Niagara"

By W. A. Lyons

Vice President, New York State Electric & Gas Corporation

An address before the 18th Annual EEI Sales Conference, Chicago, Ill., April 2, 1952

NO industry has contributed more to the development and progress of these United States than has ours. No industry has done more toward raising the standards of living of its citizens than has ours. No industry has shown greater concern for the public interest and welfare than has ours. Even with the importance of our industry to the national economy, the cost of its service to the people for 1951 of slightly over $5 billion was about 6 per cent of the proposed Federal budget for the next fiscal year. That $85 billion budget is four times the total investment in our entire industry.

Despite our industry's accomplishments, none has been more maligned than has ours. For 20 years we have been the subject of constant attacks. These attacks have their origin in the philosophy of those who would substitute an alien concept of a socialistic economy for the proven success of our free enterprise business under representative government.

While the open attacks have been going on for 20 years, the plans had been outlined at least as far back as 40 years ago. These plans are basic to all programs of socialism throughout the world. The efforts of those who envision the extermination of our industry as their ultimate objective have been largely successful during these past 20 years.

Success of Welfare State Advocates

Few people seem to remember that there were 21 investor-owned electric companies in the State of Tennessee 20 years ago. Today there is only one small company left. All the others have fallen to government ownership. In the State of Nebraska, all electric companies are owned by government. The Pacific Northwest is rapidly following in the wake of Tennessee and Nebraska. Thus have the advocates of a welfare state achieved success.

These losses to government ownership have not been through default. A magnificent fight for self-preservation had been waged by the companies which have fallen in these areas. Political and economic factors beyond the control of the victim companies have accounted for most of the defeats. It is hard to find anyone who is against flood control, irrigation, navigation, reclamation, and other governmental functions. It was under these guises that the all-out incursion into our business began in those areas. Their experiences, however, taught us many lessons. They gave to the rest of us a full realization of the threat to our entire industry, and this has brought about a unity of purpose within the industry which is stronger today than at any time in our history.

Redoubled Efforts

We must capitalize on that unity and redouble our efforts now to take advantage of the opportunities which are presented to expose completely the objectives of our adversaries. They can and will be exposed. In doing so, our commercial personnel can play the same important role that they have played in the load-building growth and business success of our companies.

Our No. 1 selling job is to resell the free enterprise of our business — the American philosophy—to the American public. There are many indications that the tide is turning toward our cause. I believe we hold the trump cards. Those trump cards are logic and facts to beat even the most rabble-rousing name-calling of our opponents.

I still have confidence in the American people. If they are given the logic and the facts, they will call a halt to the trend toward socialization of electric power. I have much reason to think that they are already doing so.

Let's look at a few of the recent encouraging signs. The proponents of government ownership, drunk with their repeated successes for 20 years, have become bolder and more brazen in their power grab. No longer do the government power planners bother to disguise their electric power objectives under flood control, navigation, irrigation, or reclamation. Now they are making their true purpose apparent to all. I think they have overreached themselves. Thus we are presented with opportunities we have not had before, to fight them on the basic issue of government ownership of the power industry against free enterprise.

There are some excellent recent examples of the Federal government's out-and-out, single-purpose campaign to go into the electric business on the taxpayers' money. One of these is the Roanoke Rapids case in Virginia. Here the Federal Power Commission issued a license to the Virginia Electric and Power Co. to develop a hydroelectric project on the Roanoke River over the objections of the Department of the Interior. Nevertheless, for more than three years, the Interior Department, as part of its undeviating and ruthless program to usurp the hydroelectric potential of all rivers for governmental development, has been using one legal trick after another to prevent Virginia Electric and Power from going ahead with the project. So far, Interior has lost every court action on the ground that it has no standing or interest in the matter. It applied for a rehearing in the Circuit Court of Appeals on the grounds that it is a competitor in the power business of Virginia Electric and Power Co. It lost this, too. The case is now awaiting appeal to the Supreme Court.

King's River Project

A similar case which ultimately found its way into court is the one involving a Federal Power Commission license to the Pacific Gas and Electric Co. for a project on the King's River in California. The Federal Power Commission in December, 1951, rejected the Department of the Interior's claim to Federal development of this project.

At the present time, a committee of Congress is considering the matter of still another project proposed by the Department of the Interior at Hell's Canyon

on the Snake River. With public sentiment on their side, Idaho Power Co. is making a valiant fight to be allowed to develop the power potential at a cost of $200,000,000 in preference to the Interior Department's proposal of a $357,000,000 job with taxpayer money. In this case, 97 per cent of the cost of the project under the government's plan would be chargeable to power and 1.4 per cent to flood control.

Power Grab in the Open

I now come to a fourth instance where the government's long-range power grab has come brazenly into the open—the project for development of additional hydroelectric power at Niagara, in my home state. Here also, the government power advocates have thrown away their disguises of flood control, navigation, irrigation, and reclamation. There is no issue at Niagara except electric power. There is no question but this: Shall free enterprise or government develop the added hydroelectric power from the Niagara river?

Briefly, this is the background. The treaty between Canada and the United States in 1950 authorized the use of additional Niagara river water for electric power generation, with continuing protection of the beauty of the famous falls.

In ratifying this treaty, the Senate reserved to Congress the right to authorize any new power development, although all previous Niagara power development on the United States side has been by free enterprise.

Congress Considers Three Bills

Three bills are before Congress:

The Lehman-Roosevelt bill for Federal development.

The Ives-Cole bill for development by the New York State Power Authority.

The Capehart-Miller bill, which will permit development by the electric companies in New York State.

The completed project, estimated to cost a minimum of $350,000,000, will add over 1,000,000 kilowatts of electric generating capacity. Not all of this is firm—it will have to be backed up by substantial steam-electric generation. The five companies which have proposed to develop the project under the Capehart-Miller bill already have the necessary steam plants.

These companies are Central Hudson Gas & Electric Corp., Consolidated Edison Co. of New York, Inc., Niagara Mohawk Power Corp., Rochester Gas & Electric Corp., and New York State Electric & Gas Corp. Representing over 10 per cent of the electric industry, they serve 90 per cent of New York State, an area of 43,000 square miles. They have almost 4,300,000 customers, or 90 per cent, and their farm customers total 130,000, or 96½ per cent. Of 6,500,000 kw of generating capacity, 1,400,000 kw is hydro, while 1,250,000 kw, mostly steam, is actually under construction. With 45,000 employees, their payroll amounted to $192,000,000 in 1951. Their taxes last year were over $161,000,000—$75 million Federal, $86 million state and local—representing 80 per cent of their residential and farm revenues. In addition, these companies have about 300,000 stockholders who also pay taxes.

Do You Want a Government Honeymoon?

Sales minded people will be interested in how our five-company proposal and the Capehart-Miller bill have been sold to our employees and the public, and the sales results. I would like to put the issues which we had to merchandise in the format of the excellent ECAP advertisement, "Do you want to pay for a government honeymoon at Niagara Falls?"

If government is permitted to build the project:

It will be built with taxpayers' money.

Based on past experience with Federal projects, it will cost millions more than the estimated $350,000,000.

A million-dollar appropriation "for further study" has already been asked.

An additional $146,000,000 will be needed for transmission lines and steam plants to firm up the new power.

It will put the government directly into the electric power business by the front door, instead of by the back door of flood control, reclamation, irrigation, or navigation. None of these government functions are involved: it is purely a power project.

Little or no tax revenue will be paid.

If the electric companies in New York do the job:

It will not cost the taxpayers a dime, nor add a penny to the growing public debt.

It will bring $23,000,000 in additional national, state, and local tax benefits, year after year, in addition to the $160,000,000 now paid by these companies.

Construction can start at once. The plans are drawn and ready and have been for over 30 years.

It will set a patriotic precedent for letting free enterprise do big jobs like this that are its function, instead of imposing them on the over-burdened taxpayers.

It will put a road block in front of encroaching socialism.

Starting Premises

We started on the premise that not only the public generally, but also the public opinion leaders had little, if any, knowledge of Niagara except as a place of scenic beauty. We also started on the premise that there were a great number of people who would feel that we had no support for private development, because the bills for Federal and state development had been introduced by the United States senators and two representatives from our own state. The bill for Federal development is sponsored by a former Democratic governor, now senator, and a Democratic representative. The bill for state development is sponsored by our other senator, a Republican, and a Republican representative from our state.

Thus, fortunately, the Niagara issue became completely non-partisan. I say fortunately, because this basic issue between uncontrolled government monopoly in the power business and a regulated free enterprise industry will not be decided by either major political party along party lines.

Presenting the Case to the Public

I am sure that even within the industry the feeling prevailed that we had no backing in New York State. We also knew that to obtain nationwide support we had to demonstrate that we did have the support of the people of New York, notwithstanding the positions of our Senators and their co-sponsors.

Immediately following the hearings before the Senate Public Works Committee and the House Public Works Committee on the three pending bills, we decided that it was timely to present our case to the public. Our objective, of course, was first to demonstrate what the real wishes of the people of New York were, and thereafter endeavor to secure nationwide support.

We formed an informal steering com-

mittee made up of representatives from each of the five companies. We retained Ebasco Services to help us coordinate the five-company program and to tie it in with nationwide efforts.

We then set about developing three steps in the presentation of our case. The first step was to get the basic facts into simple, readable form for distribution. These were incorporated in a booklet, "More Power from Niagara," a complete factual presentation of the issues and the history. This booklet was given wide circulation among opinion-forming groups throughout the country.

As the next step, each of the five companies began a program of education to reach their 45,000 employees. To do this we trained a selected group of employees to present the story to the other employees. We developed necessary visual aids and other techniques which would be devoted to putting any sales story across. Shortly after the employee meetings, we distributed a special "Questions and Answers" pamphlet based upon actual questions by employees. We are continuing to distribute pertinent information on the subject to our employee organizations. The response from our initial employee meetings was amazing. Almost to a man they were anxious to help and wanted to know how best they could do so.

Enlisting a Speakers' Bureau

The third step in our five-company program was to enlist a speakers' bureau from our own people. In our own company, and I understand the same was true with the others, there were more volunteers than we could possibly use. Upwards of 200 employees in the five companies were then trained to present the story to the public.

Sales personnel served as the nucleus for this activity, as they had in bringing the story to the employees. With their help, several basic speeches were prepared for different types of audiences. Visual aids, so important to tell our story, were developed. From this material, the speakers developed their own approach and presentation. Their ability as public speakers was unimportant. It was the sincerity of their approach which was important.

At this stage we had the people, the story, and the visual aids to present our position throughout the state. Certain individuals were assigned to personal contact work to tell our story individually to the industry, farm, labor, and other civic leaders, local, state and national legislators, and newspaper, radio, and television people. At the same time, we proceeded to offer the services of our speakers to service clubs, farm groups, women's clubs, and other organized groups. We are prepared to talk to any group, large or small, that will listen to our story.

Employee Enthusiasm

Again, we were amazed at the demand for speaking engagements. When I last heard, we had completed almost 500 speaking engagements on "More Power from Niagara" to groups ranging from a few people to almost 1,000. Our speakers are scheduled far in advance on a continuing program. They have gained confidence by the acceptance which they have received. It has not been easy for them. It has required extensive after-hours activity. They are enthused and willing to carry on, because they sincerely believe in the program's importance to the preservation of our free America.

They are living proof of free men. They will work eight hours a day for pay, 10 hours for a good boss, and 24 hours for a cause. Inspired by their efforts, others from outside our industry have taken up the cudgels for us in presenting this basic issue to the people.

Concerning sales results, the support which has been generated for our position has come up to our fondest expectations. Many important industry, farm, and labor groups in the state have endorsed the Capehart-Miller bill, which will permit private development. They are publicly supporting our position in many ways. These include the New York State Chamber of Commerce, the Empire State Association of Commerce, the New York State Farm Bureau Federation, the New York State Grange, the Citizens Public Expenditure Survey, Inc. (the state taxpayers' association), the New York State Federation of Labor, the New York State Association of Electrical Workers, the International Brotherhood of Electrical Workers, AF of L, and the Utility Workers Union of America, CIO.

Likewise, a very large number of local industry, farm, and labor organizations have endorsed our position by resolutions and are giving us important support. A large percentage of the state's newspapers, farm, and labor publications have given strong editorial support for private development. One of the most interesting things to me has been that a great number of organizations which almost never take sides or adopt resolutions on controversial subjects have done so in the case of Niagara.

Here is another encouraging sign. I can assure you that we can find practically no evidence of support for either state or Federal development in the State of New York except by the proposers of the state and Federal bills, agencies of government, and the few REA coops, which serve 4,400 customers.

A few months ago I doubt if more than a handful of people had any real understanding of the issues involved at Niagara. I have had people tell me time and again that they had noticed something about Niagara in the newpapers. They passed it over because they felt that it did not concern them. Now they are interested in its importance to them because they have heard our story.

So much for the hopeful reaction to our efforts within our own state. What about the rest of the country? In area after area, opinion leaders have been contacted to enlist their support. Some representative groups which have adopted resolutions are the Mississippi Valley Association, Illinois Taxpayers Association, the United States Chamber of Commerce, Council of State Chambers of Commerce, many of the state chambers, and the New Hampshire Taxpayers Association. Assistance has come from the headquarters of many national associations, including the American Medical Association and the National Association of Manufacturers. These and many others have informed their membership of the basic issues involved at Niagara.

Cooperation from Other Companies

Many of our fellow electric companies are telling the Niagara story to their employees, stockholders, and the public. Several have included it in their regular employee training program. It has appeared in many of the industry's house organs. Some have distributed literature on the subject to employees, customers, and stockholders. This is a real help and I assure you it is appreciated.

Favorable editorials have appeared in newspapers in over half the states. Many columnists with national circulation have commented favorably. National publications are most interested. If you have not already done so, please read the *Collier's* editorial on the Niagara question. For this, *Collier's* was attacked by the *New York Daily Compass*, circula-

tion 46,000 in New York City. We are known by the friends and enemies we make. I would rather have *Collier's* in my corner and 100 Daily Compasses as my enemies.

Much has been accomplished in the few months since last September. We are encouraged, but we still have a long road ahead. There is still some misunderstanding, both in and outside the industry between Niagara and St. Lawrence. The Niagara power development has no connection or relation to the controversial St. Lawrence Seaway and Power Project. They are on two different rivers, 250 miles apart at each end of the State of New York.

This, then, in brief, is the Niagara story to date. I do not have to tell you that the Niagara question will not be decided by the people of New York State alone. It is a matter for national legislation. Congress, representing all the states, will decide it. Many of the states are a thousand miles and more away. They have their own problems, and we all know that among the states we are not inclined to borrow our neighbor's troubles until it is proved that they concern us, too.

On the public power question I appreciate that it is often hard, even in our own industry, to rouse fighting interest in an area until a utility's own business boundaries are jeopardized.

The time has now come, with empire builders of the Department of the Interior openly showing their ruthless purpose, when every free-enterprise, inves-

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Nation-Wide Observances of Production for Freedom Week Planned for September

TO gain greater public understanding of the vital contributions made by American industry to the nation's economic and social development and to emphasize the indispensable role played by electric power in the continuing expansion of American industrial output, observances of a Production for Freedom Week are being planned for September 7-13. At that time, companies throughout the nation will have opportunity to make known their individual contributions to the communities they serve and to demonstrate, at the same time, how American industry, working through the free-enterprise system, has become a bulwark of freedom in the world today.

Preparations for Production for Freedom Week, a project of the Electric Companies Public Information Program, are being conducted by a PIP committee under the chairmanship of A. C. Spurr, President of the Monongahela Power Co.

The United States Chamber of Commerce, in urging local Chambers to take an active part in the observances, has stated that "Production for Freedom Week is designed to promote economic understanding. It is a 'hook' on which to hang local efforts to build better understanding of private enterprise, better appreciation of the role of your business firms in the unique American system of 'Production for Freedom.'"

According to PIP, the objectives of the observances are:

1. To call attention to the fact that America has attained a position of leadership in the preservation of world peace through the unimpeded genius of the American people.
2. To stress the importance of the production of each industry within the territory it serves.
3. To inform the public that business and industry can meet the requirements of the territories they serve.
4. To dramatize the development of modern tools of production, notably in the use of electric power, which have been responsible for the high productivity of the American worker and which have given him the highest standards of living in the world.

Though electric companies, in conjunction with Chambers of Commerce, will take the lead in arranging observances of Production for Freedom Week on a local level, many other local industries are expected to participate in a variety of ways. In Iowa, a state-wide program is being developed, and in other parts of the country, industrial fairs and advertising campaigns will be employed to publicize the week. The Detroit Edison Co., for instance, will conduct its observances through the media of radio and television, billboard advertising, school tours, stories on company expansion, fair exhibits, and special luncheons. The company is also planning a cooperative effort with the Detroit Board of Commerce to pay tribute to Detroit's industrial production.

On a national level, the importance of electric power to industrial advancement will be the theme of radio and television programs, magazine and newspaper advertising, and other activities. Advertising agencies will make use of the Production for Freedom theme, and some 25 trade associations will cooperate in promoting observances of the week.

While September 7-13 has been set aside for national celebrations of Production for Freedom Week, local companies and industries may have to adjust the timing of their observances to conform with local conditions. It is being suggested, however, that all celebrations be conducted as close to this date as possible in order to secure the greatest national impact.

Members of the committee, which, under Mr. Spurr's chairmanship, is coordinating plans for the nation-wide celebrations, are:

Ernest R. Acker, President, Central Hudson Gas and Electric Corp.

Charles P. Crane, President, Consolidated Gas Electric Light and Power Co. of Baltimore.

Bayard L. England, President, Atlantic City Electric Co.

George M. Gadsby, President, Utah Power and Light Co.

R. H. Knowlton, Chairman of the Board, The Connecticut Light and Power Co.

John E. Loiseau, President, Public Service Co. of Colorado.

Grover C. Neff, President, Wisconsin Power and Light Co.

James W. Parker, Consultant and member of the Board of Directors, The Detroit Edison Co.

P. H. Powers, President, West Penn Power Co.

Kinsey M. Robinson, President, The Washington Water Power Co.

Henry B. Sargent, President, Arizona Public Service Co.

McGregor Smith, President, Florida Power and Light Co.

Louis V. Sutton, President, Carolina Power and Light Co.

J. B. Thomas, President, Texas Electric Service Co.

Frank M. Wilkes, President, Southwestern Gas and Electric Co.

R. A. Zachary, Vice President, Public Service Electric and Gas Co.

Make the Most of Engineering Manpower

By A. C. Monteith

Vice President, Westinghouse Electric Corporation

An address before the EEI Engineering Committee Conference, Chicago, Ill., May 6, 1952

AWARENESS of the engineering shortage is no longer our major problem; it is the "what to do about it" that concerns us now. I wish to comment on the procurement and training of new people and on the effective use of those that are now on our payrolls. These matters are so important that they bear continued discussion. They are, I believe, the key to the continued progress of the industrial development of this company and, therefore, to the development of the electric industry.

The fact is, there is and will be a shortage of engineers. If we do nothing about it, the whole technical progress of the country is in jeopardy. Continued improvement of the standard of living is geared directly to this problem. Satisfactory answers are even more vital to the electric industry, because this shortage of technical talent is becoming acute at a time when the industry is experiencing its greatest expansion. Money and materials are needed to build the equipment and systems, but these components are not worth much without the manpower to plan and construct at this increasing rate.

The Individual's Obligation

At the outset I must emphasize that we must not relieve the individual of his obligation to work diligently and to contribute heavily to his own improvement. This is such an important part of the overall problem that I want to stress it in passing. Impatience is possibly the greatest obstacle the young, aggressive individual with potential has to overcome. This does not imply that the young man should not be continually appraising himself in the position in which he finds himself. Rather, he should, in an engineering way, be sure that the distant fields are really greener before he sets out to them.

I have observed many cases in which impatience has blinded a young man to the opportunities all around him. Russell Conwell's story, "Acres of Diamonds," well illustrates the point. In this story, an ambitious young Persian set out from his homeland to seek his fortune. He visited every corner of the earth, finally returning poor and as an old man to his home. Shortly after his return, an excellent diamond mine was discovered in his own backyard. A young man must have an objective, but he should study well the position about him. More often than not, the best opportunities are within his reach simply by working for them.

Engineers Should Do Engineering

What can we as companies do to help the problem? One of the most important steps in any program is to be sure that engineering classifications are purified. In other words, be sure men with engineering degrees and background are doing genuine engineering work. Examine your organization. You will probably be surprised at how much of the work being done by trained engineers can be assigned to supporting personnel. You should rectify such a situation promptly.

More than one thing is wrong with the misuse of trained manpower. First, of course, it aggravates the entire problem. It ties up technical manpower—manpower that takes, at the very minimum, four years to train. It is sheer waste to use trained engineers in jobs that can be filled by technicians with less specialized training.

Second, it is an economic waste to the company. We discovered a long time ago that using engineers to accomplish our testing and much of our laboratory work, etc., was the expensive way to get the job done. Don't misunderstand me. Work assignments in testing, in laboratory assistants' capacity, etc., are most effective training for many engineering jobs. But unless the potential for an individual engineer is limited for some definite reason, this work can be accomplished cheaper and with more satisfaction by supporting-level personnel.

Third, and of great importance, the young man of high possibilities will develop at a maximum rate only if his assignment is a challenge to his ability and experience. Such a man should definitely be given work that calls for all his capabilities, and more. One cannot learn to swim in shallow water, but of course the beginner must be able to touch bottom once in a while or be able to reach for a helping hand in case of emergency, such as when he recognizes that momentarily he is beyond his capacity. If young engineers are placed carefully in jobs where continued challenge exists, their rate of growth will be gratifying.

Purification of engineering jobs is essential to the morale of existing employees and is necessary if new employees are to be attracted to an organization. Also, do not overlook the fact that there are many jobs where people with liberal arts or business administration degrees do a better job than men with engineering training.

A Good Training Program—a Must

Next, in converting new people into effective employees as rapidly as possible, a good training program is most beneficial. Many industrial employers have recognized this need and currently do a good training job. Unfortunately, not all do. Transition from directed development in college to self-development in industry is not easy. The craftsman of former years grew up with the business, but the college graduate of today steps into a strange and often large organization at a relatively high level. He has had no opportunity to understand, through long association, the methods and operation of the concern. During his first few years with the company, the young engineer is finding his place in the organization, attempting to understand himself, and shaping his professional goal. Frequently he is establishing his family. Generally his salary is modest. Closing the gap between his experiences on the campus and the realities of earning a living in a complex situation is not an easy task. He needs assistance in making that transition. If this is forthcoming, his faith in himself, thus bolstered, maintains his individuality through a crucial period.

Valuable by-products turn up as a result of a good training program. Some

of these have a very broadening effect. An industry that was new to a young man a short time before employment now becomes a dynamic entity, and he feels a part of it. A good training course brings the engineer into contact with the best men available for training work. Such association provides an enduring, beneficial influence on his behavior. He unconsciously builds fences against influences that can reduce his professional status and his individuality.

A good training program instills healthy attitudes. The young graduate has been carefully selected as a potentially key man. He reports to work determined to wade in and build a reputation. These hopes are further elevated when he finds that his company is devoting the time and effort necessary to acquaint him with its policies, objectives, and procedures. He realizes that, meanwhile, he is, at best, only semi-productive, but the company sees fit to pay him a salary during the training period. Certainly this company must have plans for him.

Contrast this with the direct-employment case, that is, hiring an engineering graduate for a specific job and plopping him into it with no training period. He becomes a "productive" employee the first day, and many years may pass before he learns, piece by piece, what the overall company operation is and how it is organized. He learns the hard way what facilities or services are available to him. He may make embarrassing mistakes. He feels rather lost in a strange world during his first few years and does not realize where his opportunities may lie. In short, he is being almost pushed into that fuzzy, foggy state of mind that makes him susceptible to influences not compatible with maximum professional development.

Frequently we hear the comment, "Fine, but a smaller company cannot assume such responsibility." With this opinion I heartily disagree. In fact, a smaller company, taking only two or three graduate engineers per year, has the greatest opportunity possible to personalize the orientation and training period. Because the organization is small, closer contact with the men of experience and leadership in the organization is possible. Elaborate classroom set-ups, essential in the big company, are not necessary in the small one.

The sincere employer considers high-quality training of the young engineer to be an obligation, and his professional growth a challenge. It is certainly one way to help young engineers "do more, quicker," and, to that extent, has the effect of increasing the number of engineers, thus offsetting the present shortage. Planned training has had a prominent place in the Westinghouse operation for a long time. I can personally attest to its effectiveness in making engineers a part of the productive organization quickly.

Continued Formal Training

In addition to a good program of training, another immediate measure employers can adopt to develop the individual is to urge their younger men to continue their education. Nothing enables a man to accomplish the maximum amount of his job better than good learning habits. His morale as a budding professional man is kept high if the employer encourages and assists him to supplement his college training by evening classes or guided self-study. In the graduate-study program carried on in cooperation with several universities, hundreds of our engineers are currently broadening their horizons through advanced education. Such study includes instruction in both technical and general fields. The maturing and broadening effect is obvious.

The physical location and other factors may not permit all organizations to sponsor such programs of graduate study with educational institutions. However, encouragement and guidance from supervision will start many graduates in groups of their own in self-improvement programs.

Recommendations on this matter of training and continued education, as well as recommendations for integration into the community, self-appraisal, and reading lists are outlined in some detail in the report by the Committee on Professional Training of the Engineers' Council for Professional Development.

Development of Supporting Personnel

The development of supporting personnel deserves careful attention. Westinghouse has a program by which we try to reach promising high-school graduates who have not been fortunate enough to secure a scholarship or do not have the money for college. We bring these people in as technicians, laboratory assistants, etc., and encourage them to take technical courses in the evening. In some cases, we are providing the facility for such.

In the case of the graduate engineer who is taking continued education, or the young technician who is taking technical education for his improvement, the company pays half of the tuition at the time of the successful conclusion of the recognized course. Then, if he successfully obtains the certificate or degree mutually agreed upon as his program for improvement, we pay the remainder of the tuition.

In the case of the engineer with a bachelor's degree, the objective can always be to secure a graduate degree. In Westinghouse, we have for some time had a graduate study program at many locations, which covers technical subjects and allows men to secure advanced degrees. Over 250 men have obtained master's or doctor's degrees through this channel and the rate is increasing each year. We have as many as 600 to 800 registered each year in advanced study. This program has been broadened to include a few subjects on art and literature, and we are now working out a program where a man may take an advanced degree in business administration. Also, there have been many in-company training jobs which are being aggressively followed and improved.

In most cities this type of continued education is available to engineers. The Engineers' Council for Professional Development program is aimed to expand this opportunity for engineers in areas where it does not now exist.

For the high-school graduate in many areas there are technical schools that offer the means for educational training. In areas lacking these, it will generally be found that there will be enough interest to provide a class of sufficient size to carry forward such a program if it is aggressively initiated.

Building Management

So much for the younger people in or coming into the organization. But we must not stop there. I cannot over-stress the desirability of a program for those who have been in the company for a few years. In Westinghouse, we have initiated and are beginning to see the results of a management development program. Such a management development program will, however, never be successful unless it has the backing of top management, and this means the president of the company. It must also be directed entirely along the lines of securing sufficient data to help a man improve, and not to secure information

for rigorous criticism of him in his job.

Our program, which applies to everyone in a supervisory position, has four definite steps. The first step is to secure a good definition of each supervisory job. This is accomplished by having each supervisor write down what he thinks his own job is. This he then discusses with his immediate superior, at which time the ideas of the two are incorporated into a description of that particular job. This step is essential so that the man realizes the standard being used in appraising him. Also, it is helpful for a member of management to know the concepts supervisors have of the functions and contents of their jobs. It establishes a clear-cut understanding of what a man is supposed to do. It is surprising how the responsibilities of a job are often defined by what the former holder of it did.

We have secured enthusiastic reactions to this step, as it is has provided a much better definition of responsibilities through the entire line operation.

The second step is the appraisal of each supervisor by a three-man committee on how the incumbent is performing in the light of the responsibilities now mutually understood as a result of the first step. In addition, this committee prepares a statement as to what the potential of the man is and what further instruction will best help him develop. After this appraisal is completed, it is mandatory that the immediate supervisor, who was one of the committee of three, discuss with the individual in detail the committee's evaluation of his performance and what he can do to improve himself and to develop for advancement. These discussions are kept in the vein of constructive criticism. The comments from those appraised have been highly favorable. It gives men climbing the rungs of the management ladder the pleasant satisfaction of knowing how the boss feels they are progressing. It invests them with enthusiasm to improve themselves, with the hope, but with no guarantee, of promotion.

The third step in this program is the creation of a replacement table for the entire organization, naming, where possible, two replacements for each job. This inventory of management people casts the spotlight on the men who are ready for immediate advancement. Almost as important, it points up the weak spots in the organization. The chart is in color, the colors showing at a glance a man's educational background and his performance in his present job, as well as his potential for advancement. For example, too much red on the chart serves to warn the manager that it should be reviewed carefully, whereas a good showing of blue indicates strength in that particular organization.

The fourth and most important step in this overall program is the implementation, or how to help the man strengthen himself in his present position or for promotion in the organization. This is the follow-through and must be carried forward aggressively. If not, the program will come to be considered by the organization as simply a means of uncovering weaknesses and not as a help in correcting them.

Guidance Requested

In preparing the appraisal forms of the second step, the committees were asked to make recommendations as to what might improve the individual both as to present performance and potential. Also, in the appraisal discussion by the supervisor and his superior it is mandatory that a man be given the opportunity to suggest what he would like to have to strengthen his management ability.

A review has been made of the answers to these questions. The principal factors, listed in order of frequency, are the following. They total more than 100 per cent, of course, because some men asked for more than one type of help:

	Per cent
Training in management and management practice	35
Guidance and counsel by supervisor	35.5
Job rotation for broadening	15
Special and committee assignments	14
Public speaking	12

Instruction Courses

To satisfy the desires expressed, we are actively undertaking the preparation of instruction courses. First, these will be for men recently made supervisors, and second, for men who have been in a supervisory position for some time but who want a refresher on management principles. We are definitely establishing job rotation, placing men from engineering into manufacturing, men from sales into engineering, etc. Although we have had public speaking courses for some time, we plan further encouragement for these people to avail themselves of the opportunity presented. Also, in some cases we are recommending individual self-training. We have had a large number of men take the Harvard and University of Pittsburgh courses on advanced management.

Although the management development program has been initially introduced in the supervisory group, it is our intention to have it reach deeper into the organization as soon as possible.

Summation

In closing, may I recount the points essential in developing and fully utilizing the essential engineering personnel in any electrical organization:

1. Purify the engineering classifications to be sure that engineers are doing engineering work of high caliber.
2. Have a good training program and be sure that it is well administered.
3. Develop a continued education program for the younger employees.
4. Develop a program to bring high-school graduates in and train them as back-up personnel to relieve engineering personnel of tasks not commensurate with their training and ability.
5. Introduce a management development program that is aimed at helping individuals, not at criticizing them, and be sure to follow through with a program to implement the things found in such an appraisal of the organization.

If these programs are installed, my experience assures me that the greatest cooperation will be received from the individuals involved, and the greatest satisfaction will be attained in the reactions of employees and in their development. The pay-off will be the attraction of stronger people to individual organizations and to the industry—people who are looking for an opportunity, not just for a job.

AUTHOR'S NOTE: Excellent attention was focused on the engineering shortage by the material prepared by the Engineering Joint Council and released at the Engineering Manpower Convocation in Pittsburgh, September 28, 1951. This material defines well the problem and points to some answers. Also, reference should be made to the work being done by the Engineers' Council for Professional Development, and particularly the report of the Committee on Professional Training, in which numerous recommendations have been made with respect to the important first five years of professional development. This is one of the few publications in which the subject is well outlined. Also covered in these publications is a discussion of what to do about the shortage.

Customer Opinion Surveys—the Professional Approach

By J. R. Maher

Supervisor of Customer Relations, The Connecticut Light & Power Company

An address before the National Conference of Electric and Gas Utility Accountants, New York, N. Y., April 8, 1952

IF you have ever been on a quiz program or if you have ever listened to one, you are familiar with "the pay-off question." This is the high point, the climax, suitably introduced by a rolling of drums and followed by an awesome hush as the respondent frames the reply which will enshrine him on the heights of fame and fortune or consign him forever to the limbo of "it might have been." This phrase, "the pay-off question," is remarkably definitive. If you have the answer, success is in your grasp. If you don't have the answer, not only has the ultimate award escaped you but you have also nullified the value of the correct answers supplied to the questions which led up to the final, all important one.

"What Do Our Customers Think?"

To us in the public utility industry, there is nothing new about the pay-off question; we have contended with it for years. It has shaped practically all of our policies. It has dominated the discussion at our topmost conference tables. Like its counterpart on the quiz program, it is the ultimate test by which the validity of our preliminary calculations is measured. It goes something like this: "What do our customers think?"

It is the pay-off question in a very literal sense. There is no secret about the fact that we are fighting for our corporate lives in the arena of public opinion, and the chips are all on the line. If we know what our customers think, our position is immeasurably stronger, for we can then make advantageous use of those things which our customers favor and modify and eliminate those which meet with public indifference or hostility. If we don't know what our customers think, our public relations objectives can be but dimly defined. We are apt to be in a position where what we don't know can hurt us irreparably.

As mentioned previously, there is nothing new in this recognition of the importance of customer opinion. We have been aware of it for a long time, and for a long time we have been doing something about it. Most companies have long since adopted their own means, formal or informal, of sounding out customer attitudes.

There will be no attempt here to discuss all of the various media which companies use as barometers of public opinion. This job has been done too thoroughly in the past to merit doing again. Attention will be confined, instead, to a single method of measuring customer opinion—the customer opinion survey—and an attempt will be made to convey at least a general idea of what a customer opinion survey is, how it works, and what can be done with its results.

Usually, there are a number of questions which confront the company that is considering, for the first time, the use of a customer opinion survey. Perhaps the foremost of these questions is this: "Specifically, why should we conduct a customer opinion survey?"

Usefulness of an Opinion Survey

Few of us will argue that it is important to know what our customers are thinkng about us, but we may still question the usefulness of an opinion survey as a medium for obtaining this information. In answering this question, those who subscribe to the use of surveys will point out that our public relations efforts must deal with the facts and, perhaps even more important, what the public thinks the facts are. The opinion survey, if it is properly conducted, will supply an accurately objective appraisal of public opinion toward the company and the reasons for the opinions which are found to exist.

This will provide us with a yardstick for measuring the effectiveness of what we have done in the past and for determining what further measures may be needed in the future. An awareness of these facts will enable us to sharpen and, where necessary, redefine our public relations objectives. We will thus be in a position to concentrate on known weaknesses and to take advantage of demonstrated strength.

For example, a survey conducted for one electric company in advance of an application for a rate increase revealed that the public was not prepared for an increase at that time and, without an adequate preparatory campaign on the company's part, would oppose it. It was also learned that, if the public were given certain facts, it would go along with the increase as being justified. On the basis of this finding, the company was able to do the necessary ground work before it asked for the increase. Because of this foresight, there was practically no opposition to the increase.

What Will a Survey Tell?

Another question which follows quickly after the first goes something like this: "Exactly what will a survey tell us?" Perhaps the best answer to this question lies in another question: "Exactly what do you want to know?" Surveys have been conducted to measure public reaction to some single aspect of a company's operations, such as service, rates, employee relations with the public, government-ownership sentiment, effectiveness of advertising, and a host of other items. Other surveys, and perhaps this latter type is more common, have been conducted to obtain an over-all appraisal of what the customer thinks of the company, encompassing in a single survey all of the issues mentioned above and a variety of other factors.

A survey will give a composite picture of customer attitudes in a service area, and, if required, it can also appraise one of the opinions held by various population sub-groups. It can demonstrate, for example, how young people, as contrasted with older people, feel on certain issues; It can measure the reactions of urban groups as compared with rural groups; and it can show with a surprising degree

of accuracy just how deeply these various convictions are held. In short, an opinion survey can probe as broadly and as deeply as desired.

At one point or another, almost every company that is deliberating the use of a survey comes to grips with the question: "Shall we do it ourselves or shall we engage a professional survey organization to do the job for us?" Actually, this is an extremely important question, and it calls for careful and detailed consideration. Some companies have been conducting their own customer opinion audits for years, and they report excellent results. Others feel, with equal conviction, that the appraisal of public attitudes is properly the job of the professional, highly skilled and experienced in this type of endeavor.

This report does not propose to recommend one approach over another but is intended as a reaffirmation of the need for a thorough investigation of the facts and fundamentals of opinion studies before any final decision is made. A survey which is improperly conducted or one which produces inaccurate or undependable results can be worse than no survey at all.

It would be desirable in this report to provide a detailed description of the services available from an outside research organization and then, for the sake of comparison, explain how a number of companies have conducted similar opinion studies of their own. To do justice to such a broad assignment, however, this report would perforce be voluminous, far too comprehensive for the purpose which it is intended to serve, and it shall, therefore, deal exclusively with the professionally conducted survey.

Leading Questions

Skilled as we are in the science of utility operations, to many of us the science of opinion research is something of a mystery. "Suppose," we may ask ourselves, "Suppose we agree that an appraisal of customer opinion is necessary and suppose too that we decide to engage a professional survey organization to do the job for us, what does this decision involve? How are such surveys conducted? Specifically, what does the client company do and what does the research organization do to obtain the final picture of customer opinion? How do we know that the findings are reliable? How much will it cost? What can we do about the results?"

Probably there are still other questions which will come to mind, and to obtain a completely reliable and authentic answer, it is suggested that they be referred to a competent research organization. Within the limitations of this report, however, let us attempt to formulate at least general answers to the questions posed above, beginning with the first one, "How are such surveys conducted?"

How Surveys Are Conducted

Generally, the information incorporated in a professionally conducted opinion survey is obtained by skilled interviewers in face-to-face interviews These interviewers use a carefully determined and pre-tested questionnaire or ballot on which the respondent's answers are faithfully recorded at the time of the interview. The questions used in the ballot may be asked in direct form or they may be asked in the form of comparisons or both. Normally, these questions are asked of only a small but very carefully selected group of respondents who are, in effect, an accurately representative sample of the total population being studied.

To obtain a better idea of exactly how a customer opinion survey works, let us move on to the next question, "Specifically, what does the client company do and what does the survey company do to obtain the final picture of customer opinion?" This can be reduced, for purposes of logical presentation, to a series of steps, but it might be pointed out at the outset that there is one extremely valuable service which an outside research organization can provide that does not appear in the listing which follows: it can help to sell management on the desirability and the importance of conducting such a survey. While there may be minor differences in approach as between survey companies, the following is a relatively general pattern.

First Step—A general conference between representatives of the survey organization and representatives of the client company is held to determine what the company wants to know, what its problems are, and so on. This is an important session, as it forms the basis for much of that which follows. The research organization can render valuable assistance here by suggesting some of the issues covered by other companies in similar situations, but the job of isolating the specific issues which the company wants covered lies with the client. To enable the research organization to be most helpful, it is essential that the company be as informative and as frank as possible in this conference, providing, as grist for the mill, all possible ideas on survey questions.

Second Step—Based on the discussion held at the initial conference, the survey organization develops a tentative questionnaire which encompasses the issues on which the company wants to be informed.

Third Step—This tentative questionnaire is then examined and discussed at a second conference between the research organization and the client, and any necessary additions, changes, or deletions are made.

Fourth Step—With the content of the tentative questionnaire or ballot determined, it is then tested by the research organization on a group of selected respondents to determine its validity as a measuring instrument. It sometimes emerges from this test that what appeared to be a perfectly valid question or sequence of questioning tends to predetermine a certain kind of response. This must be avoided.

Fifth Step—Having completed its test of the questionnaire, the survey company makes whatever changes may be necessary to insure the validity of the ballot, which is then ready for use.

Sixth Step—Research statisticians then lay out the survey, determining the numbers and types of people to be interviewed, areas to be visited by the interviewers, and so on. The purpose here is to guarantee that a completely representative group of respondents be selected.

Seventh Step—The seventh step in the process is the actual interviewing performed by trained interviewers in the employ of the research organization.

Eighth Step—With the interviewing completed, the ballots are coded, then punched and tabulated on IBM Cards.

Ninth Step—The results obtained are analyzed and prepared for presentation in a comprehensive survey report.

Tenth Step—The final step in the survey is the presentation of the survey report made in person to the client by representatives of the research organization and a discussion of this report and what it means.

It will be noted from the foregoing that a survey conducted by an outside organization makes exceedingly modest demands on the time and energies of the client company.

Underlying any consideration given to

the possible use of a survey of the type which we are discussing is the question of reliability of results. Clearly, if we are to go to the expense of conducting a customer opinion poll and if we are to base subsequent action on the results obtained, we should be sure that the answers we get are dependable.

Reliability of Surveys

Professionals in the research field tell us that reliability depends upon:

1. The number of people interviewed (the size of the sample).
2. The kind of people interviewed (the representativeness of the sample).
3. The questioning technique based on the skill, experience, and ingenuity of the research organization.

Suppose we take a longer look at each of these items and see what they mean. Beginning with the size of the sample, how many people must be interviewed in order to obtain an accurate representation of general customer attitudes? To those of us who are inexperienced with opinion studies, the answer to this question comes as somewhat of a surprise, as it is smaller than we might expect. Perhaps the best way of illustrating this relationship between the size of the sample and the reliability of the results obtained is by way of a series of examples.

Let us suppose that a survey, based on a properly balanced sample of 500, revealed that 70 per cent of a company's customers favored private ownership of electric companies. Using a standard formula, it can be stated that the chances are 99 out of 100 that the true figure lies somewhere between 64.7 and 75.3 per cent. In other words, the finding of 70 per cent in favor of private operation is subject to a possible error of plus or minus 5.3 per cent.

Now let us suppose that the findings mentioned above were based on 1000 instead of 500 respondents. How would this affect the reliability of our answer? Using the same example of 70 per cent in favor of private operation and again assuming that the same research safeguards have been observed, we find that the chances are 99 out of 100 that the true figure now lies somewhere between 66.3 and 73.7 per cent. Stated another way, through increasing the size of the sample group from 500 to 1000, we have reduced the margin of error on this question from plus or minus 5.3 per cent to plus or minus 3.7 per cent.

It will be noted from this that as the size of the sample group increases, the margin of error decreases. To provide one last example, let us assume that our results were based on 2000 properly balanced interviews. We now find that our answer of 70 per cent in favor is subject to an error of plus or minus 2.6 per cent or that the true figure, based on this larger sample lies, in all probability, somewhere between 67.4 and 72.6 per cent.

It might be concluded from the foregoing that, for most business purposes where variations of 3 to 5 per cent are acceptable, a sample group of 500 to 1000 respondents would be adequate. This conclusion, however, would not be entirely accurate. While a sample of the size mentioned would normally be sufficient to give us an accurate over-all appraisal of customer attitudes, it might not be large enough to provide us with contrasts in group thinking. Thus, while a survey based, let us say, on 800 respondents would give us a reliable evaluation of customer attitudes in general, several hundred additional respondents might have to be added to permit valid contrasts between the opinions of farmers and city dwellers, between upper-income and lower-income people, between the thinking of younger and older elements, and so on.

Another determinant of the reliability of survey findings is, as mentioned previously, the representativeness of the sample, or, stated in another way, the comparison of the sample to the total population. Professional research people tell us that if the opinions of a small group are to be accurately representative of a larger group, then the various population groups must be represented in the sample in about the same way that they occur in the whole population being measured. This means that the sample must be broken down according to age groups, sex, income levels, rural and urban groups, etc., in the same proportion as these groups are represented in the total population. Clearly, this places a real demand upon the skill and the experience of those conducting the survey.

A third element in determining a survey's reliability is the questioning technique and a highly expert technique it is. There are two factors which make this job especially difficult—it is difficult to obtain criticism, and people often like to appear better informed than they actually are. The questions selected should mean the same thing to everyone; they should proceed from the general to the particular; and they should be asked in such an order that the reply to one question will not precondition the next response. Further, the question should not itself be informative and it should present real and logical alternative answers. Care must be exercised to avoid the introduction of bias, except in those cases where bias is intentionally introduced to test the firmness of the convictions held. In general, the only factor which limits the length of the questionnaire is the interest of the respondent.

A consideration of the factors examined heretofore reveals that the job of conducting a survey can be quite complex. It is natural to ask, therefore, "How much does all this cost?" Unfortunately there is no completely definitive answer to this question, as the price bears a direct relationship to the size and complexity of the job. Approximations vary so widely that they will be of little use for our purposes but, in general, it can be said that the price of a survey, like the information which it produces, depends upon what the client wants to know.

Most Significant Consideration

Perhaps the final and certainly one of the most significant considerations governing the value of a survey is the question of usefulness of results. Essentially, research of this sort is diagnostic rather than remedial. As is the case with its medical counterpart, it is what we do with the diagnosis which we receive that counts most heavily.

Naturally, the action taken on survey findings depends on what these findings are. Favorable results can, themselves, be used to influence public opinion. Most of us are familiar, for example, with the cigarette advertising which proclaims that surveys reveal four out of five doctors smoke a given brand. When an opinion study reveals that certain company policies meet with public resentment, it may be possible to modify these policies to the end that they will be more favorably received. Where general public ignorance is shown to exist, specific action can be taken to combat it.

In one recent survey, it was disclosed that customer resentment against company rates was particularly prevalent among those who did not know that rates were regulated by the state public utilities commission. This finding became the basis for a comprehensive public information program designed to inform all of the company's customers of the rate regu-

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A Current Look at Frauds and Embezzlements

By J. C. Myers

General Auditor, Union Electric Company of Missouri

From an address before the National Conference of Electric and Gas Utility Accountants, New York, N. Y., April 8, 1952

EVEN a casual study of frauds and embezzlements will reveal that the human element in any business is weak and likely to go astray if opportunities to do so are numerous.

In *Personnel Management,* by Scott, Clothier, Mathewson, and Spriegal, published by McGraw-Hill, an interesting summary of lie detector tests made by 60 Chicago banks and department stores is presented. The banks found that 62 per cent of all persons handling cash admitted thefts, while the department stores found that 85 per cent of their employees admitted misappropriating money, merchandise, or both.

The results of these tests should make auditors willing, in fact eager, to re-examine their entire organizations to see whether or not any "natural setups," i e., situations that are conducive to fraud, have been overlooked.

Use of Lie Detectors

This textbook develops the further fact that if employees who are to handle cash or mechandise are screened by the use of lie detectors before being hired and are told that further tests will be made from time to time, less than 2 per cent go on to steal from their employers, as shown by subsequent reviews. The knowledge of the fact that further tests are to be made is no doubt a very effective form of moral suasion which keeps the selected employees from getting into trouble. However, while lie detector tests are still used by the Defense Department on job applicants and employees in posts involving "absolute security," I am sure that the public-relations minded managements of most utilities would not condone such a practice.

A study of the large mass of data on frauds and embezzlements published by the various fidelity companies revealed some further interesting facts. Most of the information I am going to present was taken from "Embezzlement: Is There a Hand in Your Till?" from *Changing Times,* the Kiplinger Magazine of September, 1950, and from two studies of defalcations in business made by the United States Fidelity and Guaranty Co. of Baltimore.

These sources indicate that embezzlement is more common than robbery and much more costly. Employee dishonesty apparently constitutes a business hazard second only to fire. Estimates of the current loss to business from "trustworthy" till tappers run as high as $600 million annually. This is quite an increase from the $200 million estimate for the years prior to the war. Apparently today's embezzlers are enjoying a field day.

No "Embezzler Type"

What kind of individual becomes an embezzler, and how is he or she picked out of a crowd? This question brings us to the crux of the problem: *there is no distinct embezzler type of employee.*

The picture of the average embezzler does, in fact, bear a startling likeness to the average American white-collar worker. Most embezzlers are about 34 (although the ages run from 15 to 85), married, and have children. They are not low paid but are in the middle-income group. Many work for their employers about two or three years before they begin to rob his till. Their jobs? Salesmen, bookkeepers, delivery men, tellers, cashiers, pay clerks, warehousemen, branch managers, secretaries, vice presidents, office boys—yes, and even auditors. Dishonesty apparently is no respecter of persons. While male embezzlers still predominate, percentage-wise, there are now about four times as many women as were found in the prewar studies. The increase in the number of women appears to reflect the more widespread employment of women in the years of World War II and immediately thereafter and their increased importance in positions of trust.

Employees' Motivations

What makes an employee become an embezzler? Lester Pratt, a Washington, D. C., accountant who specializes in ferreting out bank embezzlers, says the crime of embezzlement is rarely premeditated. It just happens one day that the temptation is too great—and another trusted employee becomes an embezzler.

Many embezzlements start with a seemingly innocent, self-authorized "payday loan." The employee merely "borrows" a bit to tide him over until payday. If replaced in time, no one is the wiser, but this practice has a tendency to get out of hand so that the borrower in the end becomes an embezzler.

Loss of savings, reduction in income, accumulated or foolishly acquired debts, living beyond his means, the "other woman," excessive drinking or gambling, an ill, nagging, or extravagant wife, sick children, any or all of these plus a host of other reasons may be the direct cause of any employee becoming an embezzler.

Pratt says there are two ingredients in the crime of embezzlement. One is management's sin; the other is the embezzler's contribution. The first is temptation. If in the course of his work the employee is faced with opportunity to steal, through sloppy accounting systems, poor internal safeguards, that is one element. Add to it the second element, desire, caused by any of the reasons or extenuating circumstances mentioned above, and the stage is set for embezzlement. As auditors, our prime duty is to be certain that the first element, management's sin, has been eliminated in our companies insofar as it is possible to do so.

Role of the Auditor

In this connection, it is interesting to note that in 91 per cent of the cases covered by these studies, the money or property for which the embezzlers were responsible was checked or audited at regular intervals. It appears that the auditors in question might be accused of a lack of appreciation of the fundamentals of good internal control. This is somewhat substantiated by the fact that collusion was present in only one out of every seven cases studied.

Undoubtedly many of the cases were the result of what Pratt calls poor internal safeguards—or the failure on the part of the auditor and/or systems man to devise accounting methods and procedures that provide for automatic checks

on the work of the employees involved, thus making collusion a necessary factor in any fraudulent endeavor. The ideal system of internal check or control would preclude any fraud whatsoever, except through the collusion of two or more employees.

It must be granted that there are many cases where it would be impracticable or uneconomical to set up a good system of internal control. These situations represent a challenge to the ingenuity of the auditor who under such circumstances must be clever enough to so vary his work that he effectively keeps the employees in question "off balance."

How does an embezzler operate?

It has been said there are at least 200 types of embezzlement. After reviewing the Internal Auditing Committee's audit case histories, I believe it can be stated that the utility industry's embezzlers have not been lacking in ingenuity and could probably compile their own list of 200 or more variations. It may be of value to consider some of the conclusions drawn by the parties who presented these cases, and the following is a summary of the more pertinent observations made by these parties:

1. Internal auditing has a great psychological effect upon the employees subject to review and can be an excellent fraud preventative. It serves as an acceptable form of moral suasion, deterring many who might otherwise become embezzlers.

The case in consideration shows that internal auditing must be a constant force to be of any real value. The discontinuance of auditing effort over a protracted period of time allows employees to succumb to temptation. In the words of the detected embezzler, a district office manager who undoubtedly had the entire accounting operations for his area in "the palm of his hand" and under his direct control, "Since you fellows have not been here for several years, I figured that you weren't coming back and therefore concluded that I could get away with this defalcation without detection."

This might be called a clear-cut case of what Pratt calls "management's sin" —the failure to protect an employee, not subject to other adequate internal controls, by having his operations reviewed by competent internal auditors.

2. Many cases recognized the need to establish sound internal controls and indicated how this had been done. Quite a few of these cases illustrated the preventative value of auditing in the sense that the auditor can ferret out weak spots and set up necessary controls even before someone has taken advantage of the situation and gotten himself into trouble. The summation sentence of one case—no fraud had occurred, this was strictly preventative medicine — put it very nicely: "This new arrangement separates the responsibility for the handling of cash from the associated accounting therefor, and the work of one person is now supplemented or completed by that of another."

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"More Power from Niagara"

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tor-owned, taxpaying electric company in the country must admit itself to be in jeopardy.

I submit to you also that there no longer is any excuse for apathy. There also is no longer any reason for the feeling of hopelessness that has depressed many after TVA, Nebraska, and the discouragements in the Northwest.

Sales minded people constitute the front line in this battle for free enterprise. A prospect half sold is a sale ready to be closed. Our experience in New York State in itself is proof that the day has passed when the public accepts without question the decrees of a paternalistic bureaucracy. The public wants to be informed. It is in a questioning mood. It is already more than half sold that development of hydroelectric power by taxpaying, investor-owned companies is a better bargain than government development that will cost millions more in taxpayer money.

The job before us is a selling job. The product to be sold has vital value everywhere. All the logic and facts are on our side. The opportunities for telling our story are unlimited. The commercial departments of our industry can reach audiences in every city, town, and crossroads of the nation.

Not so long ago, Niagara, Hell's Canyon, King's River, and Roanoke Rapids would have been delivered into the hands of the public power planners overnight. Today there is a real effort from many sources to stop these government grabs. If free enterprise can prevail on these and other clear-cut cases, and if Congress passes the Capehart-Miller private enterprise bill for Niagara, we will have reversed completely the trend toward nationalization of the industry that powers America's industrial might.

Customer Opinion Surveys

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lation story and the role of the commission.

The "no opinion" group also has particular significance. It can be used to refute the claims of those who would have us believe that public opinion is solidly behind one issue or another. More important, however, it serves to mark off a fertile field for our public relations efforts, because those who do not have definite views on a subject are usually more easily won over than those who have already made up their minds.

Most important of all, a survey yields specific information upon which specific action can be taken, enabling us, in designing our public relations activities, to use a rifle rather than a shotgun.

Companies have used survey results as a basis for correcting specific causes of excessive criticism in certain areas served, for changing advertising and other communications themes, for preparing booklets and other materials to meet specific information needs, for redirecting efforts of customer- or dealer-contact people, and for a host of other purposes. In many cases, survey organizations are able to suggest certain courses of action based on experience gained with other companies which have confronted similar obstacles. In the last analysis, however, the responsibility for deciding what must be done rests with the company itself.

Whether or not we subscribe to the use of surveys, I think most of us will agree that in these critical days during which free enterprise is on trial, we must be more than ever alert and responsive to public opinion. Whatever our methods of sampling public opinion may be, if we use them intelligently and act on them wisely to-day, a tomorrow of free enterprise will be more fully assured.

How Much Internal Auditing Is Enough?

By Charles J. Nichols

Auditor, Consolidated Gas Electric Light and Power Company of Baltimore

An address before the National Conference of Electric and Gas Utility Accountants, New York, N. Y., April 8, 1952

IN attempting to resolve "how much auditing is enough?" one must necessarily consider the interests of top management, the independent public accountant, and, last but not least, the internal auditor. Any top executive will readily admit that as a company increases in size and organizational complexity, it logically follows that increased authority must be delegated to subordinates and greater reliance placed upon adequate administrative checks and balances. Notwithstanding this needed delegation of authority, management still retains the primary responsibility for safeguarding assets and for maintaining efficient operations.

Human Equation of Big Business

While the organizational structure of a company may be properly designed to accomplish maximum checks and balances between "line" and "staff" functions, such mere functional segregations alone do not assure effective managerial control. Management's greatest problem is that of coordinating and maintaining constant harmony among functional or divisional heads, to the end that all phases of a company's operations are effectively administered. A Harvard professor once described this balancing of equities as the "human equation of big business."

In the divisional type of corporate organization in which separate officers have responsibilities for production and operations, sales, finance and accounting, and, perhaps, industrial or employee relations, the interests of one division may conflict with those of another. Moreover, many divisional or department heads are often so busily engaged in supervising their day-to-day operations that they have little time for objective evaluation of their practices and procedures. Nor can supervisory personnel be expected to admit readily to management that inefficiencies have crept into their operations. Such action would be commendable indeed, but it presupposes a basic departure from normal human behavior.

In this changing world one cannot remain static without becoming decadent. During the past ten years, our respective companies have experienced unprecedented expansion of physical facilities and personnel, involving virtually every phase of operation. Practices and procedures of ten years ago may today prove ineffective and uneconomical. In a recent publication I was interested in the following maxim: "When something has been done in a particular way for 15 or 20 years, it is a pretty good sign, in these changing times, that it is being done the wrong way."

Furthermore, the acute labor problems of recent years have had deterring psychological effects on all supervisory personnel. Assuredly, departmental and divisional heads have been inclined to apply somewhat the laissez faire doctrine to personnel performance. Executives and administrative analysts have recognized these trends and are endeavoring to find new and improved methods of managerial control. One phase of such control has been the expanded use of internal auditing as a function distinct from that of accounting. In a relatively short span of years, internal auditing has emerged from a routine checking function to an independent staff service for top management.

Responsibilities of Internal Auditors

In this connection, have you ever studied a representative number of corporate organization charts and then attempted to answer the question: "On whom should management rely for independent analysis of departmental operations and the submission of unbiased reports on practices and procedures, adherence to management's policies, personnel evaluation, and operating efficiencies?" After making such an objective study, a leading university professor concluded that the internal auditor was the only logical individual who should be assigned such responsibilities.

Howard Kellogg, Assistant Chief Accountant of the Securities and Exchange Commission, last year before the New York Chapter of the Institute of Internal Auditors made the observation that "internal auditing staffs are, to a rapidly growing extent, being utilized for purposes considerably beyond the scope of traditional internal control in the strict sense that it contributes, via the public accountant's certificate, to investor and public protection against fraud. This extension is in the direction of operations study or the analysis of performance and execution of policy in various phases of a company's operations." Internal auditing is no longer associated with or limited in its scope to traditional accounting subjects. It is now a service aid to management in evaluating departmental and divisional performance in terms of management's policies and objectives.

Formulating Standards of Performance

Thus, management's dependence on internal auditing is now well established, though it is in the area of transforming this functional responsibility into standards of acceptable performance that the internal auditor is confronted with his most perplexing problem. While satisfying management's demands is undoubtedly the prime consideration of the internal auditor, he cannot overlook the attitudes of the independent public accountant in formulating his audit program.

The primary responsibility for safeguarding the assets of concerns and preventing and detecting errors and fraud rests on management. As representatives of public utility companies, whose activities are dedicated to the public interest, we should always be mindful that any large incident of defalcation or fraud and, indeed, any large-scale inefficiencies in any segment of our operations, may well serve as the basis for public condemnation. Nor can management delegate these inherent responsibilities of stewardship to the independent public accountant. In this connection, the American Institute of Accountants, through its Committee on Auditing Procedure, has stated: "It is impracticable for public accountants to make detailed audits of most companies within economic fee limitations." Instead, the independent public accountant must necessarily rely, to a great extent, on the

effectiveness of a company's system of internal control, important elements of which are the scope and activities of the internal auditing staff. The work of the public accountant should be properly regarded as a complement rather than as a substitution for the examinations by the internal auditor.

The public accountant is concerned primarily with expressing an opinion on the reasonableness of dollar amounts contained in financial statements. He naturally employs those auditing techniques which will enable him to express such opinion with a minimum expenditure of time. The internal auditor, on the other hand, is concerned not only with the verification of dollar amounts but also with determining whether the particular transaction was properly authorized and recorded in accordance with established procedures. Also, he endeavors to appraise the adequacy and effectiveness of such procedures and to recommend changes if the end result is the improvement of internal controls or greater efficiency in operation.

In fact, the evolution of internal auditing has been toward placing diminishing emphasis on the analysis of ledger accounts and examination of supporting documents and devoting increasing effort to the area of measuring the efficiency of personnel and departmental performance. These trends logically emanate from top management's interest in learning whether company policies are being adhered to and whether procedures are adequate, as well as whether dollar amounts appearing in financial statements are correct. The internal auditor, however, must continue to evaluate properly this latter responsibility because the amount of effort devoted to this field is a factor considered by the independent public accountant in determining the scope of his audit procedures and the extent of his tests.

Requirements of Public Accountant

In attempting to resolve how much auditing is enough, the internal auditor should first endeavor to satisfy, at least, the minimum requirements of the independent public accountant. Investors, the public, and regulatory authorities alike place considerable importance — and rightly so—upon the independent certification of financial statements. In accepting this responsibility, however, the American Institute of Accountants has stated: "In most engagements undertaken for the purpose of expressing his independent expert opinion, the public accountant expects the company's accounting department to produce financial statements and collateral accounting records which management is satisfied are proper, complete, and free of material error." Hence, in recognizing management's basic responsibility for the authenticity of financial statements, the internal auditor should include among his responsibilities a periodic verification of all balance sheet accounts. Such verification should be coordinated to the maximum extent with the activities of the independent public accountant.

Opportunities for Expanded Cooperation

Many public accountants now permit the internal auditor to prepare all confirmation requests to banks, fiscal agents, registrars, trustees, and custodians, as well as to utility customers, requesting confirmation of balances. Through verification of accounts, the internal auditor can vouch for the accuracy of financial statements on management's behalf, and his activities should reflect in the scope of the public accountant's examination and the fee charged. Opportunities for expanded cooperation between the internal auditor and the independent public accountant are becoming increasingly evident in many companies. Such coordination of activities would certainly appear to be in the best interest of both industry and the accounting profession. To repeat, the two functions, for practical purposes, are complementary.

In auditing the accounts and records of any company, there is no sure mathematical formula—at least to my knowledge and experience—for determining what constitutes reasonable coverage. Audits requiring complete verification of all transactions should be a rarity indeed. The internal auditor's greatest problem is that of knowing when to be satisfied. At best he must rely largely on judgment and experience, although ever recognizing that inadequate test checks usually result in erroneous conclusions, while at the other extreme, too many test checks constitute economic waste.

In recent years there have been a number of very interesting and informative books published on the subject of scientific sampling. In fact, statistical sampling based upon the computation of probabilities is now being advocated as the panacea for the auditor in his efforts to establish how much auditing is enough. While I do not profess to understand fully all the connotations of scientific sampling, I am reasonably certain that no fixed standards will ever be developed to supplant sound judgment and experience. While a 5 to 10 per cent, or even smaller, test check may be appropriate for certain operations, a much higher ratio would be necessary for other types of work not subject to the same control.

Incidentally, speaking of percentages and ratios, many auditors place entirely too much emphasis on the number of clerical inaccuracies encountered in their audits and make no attempt to evaluate such errors in terms of acceptable performance. This practice is not only annoying to department and divisional heads, but, equally, if not more important, it results in the auditor's activities being identified largely as a checking function. The objective auditor establishes from experience and judgment what he considers to be a reasonable standard of performance for each clerical operation, recognizing, of course, that human beings, like modern business machines and even certain equipment such as boilers, turbines, transformers, etc., are not always infallible. Ordinarily, errors can be reduced and sometimes even eliminated through lower productivity of employees or by a complete verification of the original recordings. Both methods at times are very costly and are therefore unwarranted. Some auditors have an aversion to complimenting others for a job well done. They often demand perfection of others when in reality few, if any, companies could justify the expense of perfection. In other areas, the auditor should be able to discern what are reasonable business risks, whether in the fulfillment of his own responsibilities or in evaluating the performance of other company departments. To illustrate, in examining accounting records, he must learn to accept many figures without question because of their relative unimportance. In other instances, a mere inspection of accounts or a comparison with the prior year's results may suggest the need for only a minimum examination.

Evaluating Individual Performance

While management looks to the internal auditor for independent appraisals of the practices and procedures of all departments, many auditors still confine their activities primarily to accounting results. Obviously, an effective system of accounting is indispensable to managerial control, but, from my observations, few, if any, of our accounting systems provide utility management with

adequate means for evaluating individual departmental performance. True, our systems of accounts are prescribed by regulatory authorities and the accounting segregations provided thereunder are not intended to conform to specific departmental operations. However, many companies have further subdivided their accounts to obtain more informative functional segregations of costs, but until such systems associate accepted units for measuring performance with related dollar amounts, management cannot determine readily what is achieved for the dollars expended. Moreover, the internal auditor who has had any extensive experience in evaluating departmental performance soon learns the man-hours are a much more effective yardstick in cost control than mere dollar amounts. In these days of inflated dollars, we all know that statistical comparisons expressed in dollar amounts have shown big increases in recent years.

When performance is expressed in terms of man-hours for a specific number of meters tested, meters installed or removed, poles erected, miles of overhead or underground lines, customers' appliances serviced or utility bills released, etc., a comparison of similar data over a period of years may well reflect changes in departmental productivity and efficiency. A sound system of internal auditing is one of the most efficient means of securing high levels of performance by all company departments.

Time and close familiarity with any operation often obscure the need for change; therefore, vigilant independent analysis is the only assurance that acceptable performance standards are maintained. Some departments are inclined to interpret their effectiveness on the basis of the number of transactions handled and the promptness with which they are completed. The internal auditor, on the other hand, endeavors to associate all transactions with specific company policies and practices. It is not uncommon upon investigation to find that such policies and practices originated many years ago and, as a result, are now outmoded by present-day standards.

To many auditors, a review of departmental time sheets is an uninteresting assignment. Yet, in many companies such reviews provide the only means of determining whether or not there has been any upward trend in the number or ratio of non-productive calls by company employees engaged in customers' service activities. Similarly, such analyses may indicate unfavorable trends in the ratio of travel time to productive time of field personnel. This condition may be due to inefficient scheduling or dispatching of calls for the workmen or the need for further decentralization of operating personnel. The latter has become particularly significant during the past ten years with the unprecedented development of suburban and rural areas served by most companies.

As an industry dedicated to the public interest, we must place increasing emphasis on the importance of cost control and strive more than ever before to give proper recognition to the economic aspects of every phase of our operations. Let us never forget that our individual companies should be just as much concerned about receiving full value for all of our expenditures as we are about receiving all of the revenue we are justly entitled to for our products and services.

It should now be apparent that I am a proponent of operational or functional audits, principally because of their importance to sound managerial control. While such audits demand great ingenuity and resourcefulness of the internal auditing staff, they are effective in helping top management and each level of management to achieve the standards of performance which they themselves are desirous of maintaining. The internal auditor should approach all operational or functional audits as a practical businessman and not as a theorist. He should be alert to economic factors, particularly that business risks should be measured very often in terms of cost of control. And, above everything else, he should be an astute observer of people and should recognize the importance of the human factor in the success of any company operation. Conversely, his actions should never be those of the destructive critic who conveys the impression of being dissatisfied with everything and everybody, without being able to make any constructive suggestions for improvement.

Operational or functional audits of all operations of a company should not be attempted every year. An annual program of such magnitude obviously would be impractical and, in many respects, non-productive. Instead, the internal auditor, together with top management, should carefully consider all operations each year and then select a limited number for intensive audit. While the auditor may not get as broad a coverage each year, his more comprehensive coverage of a specific number of operations should prove more beneficial to the company's interests than the conventional type of audits.

In concluding this objective evaluation of the internal audit function, I should perhaps confess that it is easier to state the principles involved than it is to apply them effectively. However, if the principles are accepted, I believe that auditors can render the most useful service to the managements of their respective companies.

Frauds and Embezzlements

(*Continued from page* 164)

3. Many cases served to drive home forcibly the lesson that adequate methods, procedures, and controls are of little value unless they are "policed" by internal auditors. Without this follow-up, the methods and procedures are soon discarded or altered, and the controls no longer function properly.

How, as auditors, can we best attack the problem of frauds and embezzlements? I believe the first thing to do, and I descend to the vernacular to adequately describe it, is to "case the joint." Review all of the operations of a company thoroughly and methodically, looking for areas in which fraud could flourish. Certainly, auditors bring better tools to this job than the average embezzler! Any weak spots found should be corrected, if possible, by establishing adequate internal controls.

If it is impracticable or uneconomical to set up adequate controls, it is up to auditors to try to function as a satisfactory substitute for the lack of "automatic" controls. Audits of questionable locations will, of course, be more frequent and on more of a surprise basis than usual. Perhaps persons in these jobs subject to little control could be rotated, i. e., transferred to other jobs periodically, to keep them off balance. They should certainly be forced to take regular vacations.

Management should be apprized of these control blind spots, and if the risks are large the question of fidelity insurance should be given adequate consideration.

Chemical Heat Storage for Heat Pumps

A Progress Report Prepared by the Joint AEIC-EEI Heat Pump Committee

In the September, 1950, BULLETIN *a preliminary report on the initial investigations made by the joint committee concerning the use of chemical heat storage was presented. Since that time, additional investigations have been completed on a specific chemical and container for possible use as a heat-storage sytem in conjunction with a heat-pump system. This progress report is presented as an informational service of the committee to indicate the present investigation status of heat-storage media using the heat of fusion principle.*

CHEMICALS employing the heat of fusion principle have been considered and utilized to a limited extent in solar-heating systems for several years. Since its inception in 1947, the Joint AEIC-EEI Heat Pump Committee has maintained a continuing survey of published literature on the subject of solar heating. The original reason for committee interest in solar heating was the possible use of a solar system as a supplementary heat source for a heat-pump system. Published information on the use of chemical storage for solar heating indicated to the committee that a chemical system of storing surplus heat from a heat-pump system during low-heat demand periods, for use during maximum demand periods, might be feasible.

The initial phase of investigation on chemical heat storage was included in the 1950 program of the committee, and preliminary investigations were initiated at Massachusetts Institute of Technology early in 1950. These preliminary investigations, under the direction of Prof. Gordon B. Wilkes, were made on a commercial grade of disodium phosphate dodekahydrate in various sizes of containers. Results of this investigation, published in the September, 1950, BULLETIN, indicated that the particular chemical had characteristics which might possibly be utilized in an efficient heat-storage system. It was also indicated that additional research was necessary to determine the shape and size of container to be used in this type of storage system to obtain maximum efficiency in operation and economy in production.

During the latter part of 1950, several discussions were held with container manufacturers, packaging firms, chemical producers, and investigators familiar with the chemical phenomena of the heat of fusion principle. Dr. Maria Telkes of Cambridge, Mass., an investigator of solar-heating systems using the heat of fusion principle for heat storage, was retained by the committee as consultant during the investigations carried out at the General Laboratories of American Gas & Electric Service Corp. in Power, W. Va. This report is a résumé of the methods of testing used at the laboratories, results obtained, and conclusions drawn after study of the test data.

Purpose of Tests

The purpose of the laboratory tests was to determine (1) the reversibility of disodium phosphate dodekahydrate, (2) the amount of heat released and absorbed by the salt during each cycle, (3) the necessary length of the heating and freezing cycle with a temperature range of 80-115 F, and (4) the amount of corrosion of the inside and outside of the containers. In these tests, five containers of disodium phosphate dodekahydrate were used, and it was specified that all of the five samples show evidence of good recrystallization for at least 100 cycles without any chemical change of the salt. It was further specified that at least 80 per cent of the theoretical available heat should be released during each cycle. Since the theoretical heat of fusion of this chemical is 114 Btu per lb, including the specific heat of the salt to a temperature of 115 F, the amount of heat to be released per cycle was specified to be not less than 91.2 Btu per lb.

Description of Equipment

A completely automatic set-up for testing the containers was designed, including:

1. Calorimeter for the five sample containers.
2. Water-supply tank to provide water at 80-85 F and 105-115 F.
3. Time control of water-temperature cycles.
4. Thermocouples in center of containers and at inlet and outlet of calorimeter.
5. Multiple-temperature recorder.
6. Measuring device for water-flow rate through calorimeter, water flow to be approximately 16.7 lb per hr.

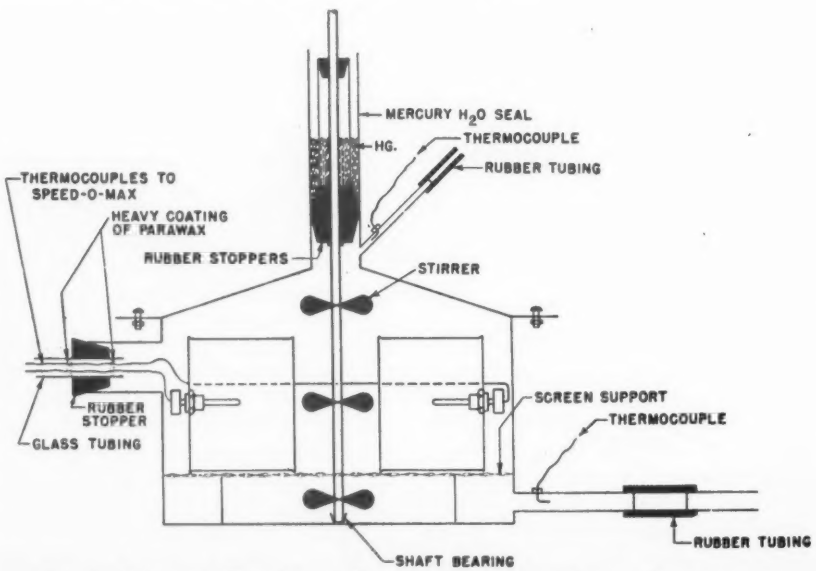

Fig. 1—Schematic Drawing of Calorimeter Used in Testing Containers of Disodium Phosphate Dodekahydrate.

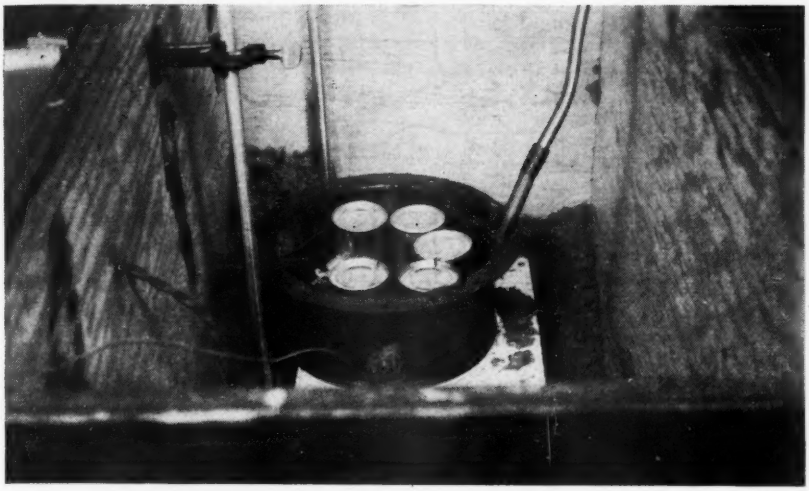

Fig. 2—Calorimeter with Cover Removed Showing Position of Five Cans of Salt.

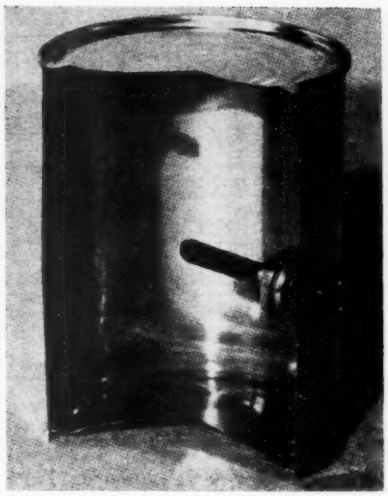

Fig. 3—Thermocouple Installation in a Test Container.

The calorimeter was constructed of 16-oz copper and designed to contain the five sample containers, as shown in the schematic diagram, Fig. 1. Water enters on the side of the calorimeter at the lowest point and leaves at the top of the conical cover. The stirrer was used to circulate the water in order to have a uniform temperature throughout the calorimeter. The cover was conical to allow the air from the heated water to escape freely from the calorimeter with the outlet water.

The five test containers were supported by a copper wire screen in such a manner as to assure good circulation of water throughout the calorimeter and at the same time reduce the conduction losses by isolating them from the walls of the calorimeter. Fig. 2 is a photograph showing the five test containers in the calorimeter.

After several unsuccessful attempts to record accurately the salt temperature in the center of each of the containers, the method illustrated in Fig. 3 was tried and found to be very satisfactory.

The temperatures at the center of each of the five containers, at the inlet and outlet to the calorimeter, and in the water supply tank, were recorded throughout the 100 successive cycles in the test period. These data were used to plot graphs for each cycle, samples of which are shown in Figs. 5 and 6.

Fig. 4 shows the calorimeter calibration curves for 3-hr and 4-hr cycles. These curves show the heat exchange between the water and calorimeter with five sealed cans containing air in place of the salt. The product of the area between curves "A" and "B" in square inches and the equivalent Btu per sq in. will give the heat exchange in Btu. In the case of the 3-hr cycle, the heat exchange was computed to be 251 Btu for the melting cycle and 152 for the freezing cycle.

The difference in the value between the melting and freezing cycles is partly due to the direction of the heat transfer between the calorimeter and the ambient. During the melting cycle, the heat flows from the calorimeter to the insulation, piping, etc., and during the freezing cycle only a portion of this heat returns to the water in the calorimeter. The rate of the heat leakage during the melting cycle is represented by the 1.25-F temperature difference between the two curves at the end of the cycle. In the heat exchange, shown in Fig. 4, the final outlet water temperature is 110 F, but in the salt tests this temperature seldom ever exceeded 107 F. When the net heat to and from the container of salt was computed, a correction was included to take care of this condition.

The temperature-time curve for some of the cycles with the five containers of

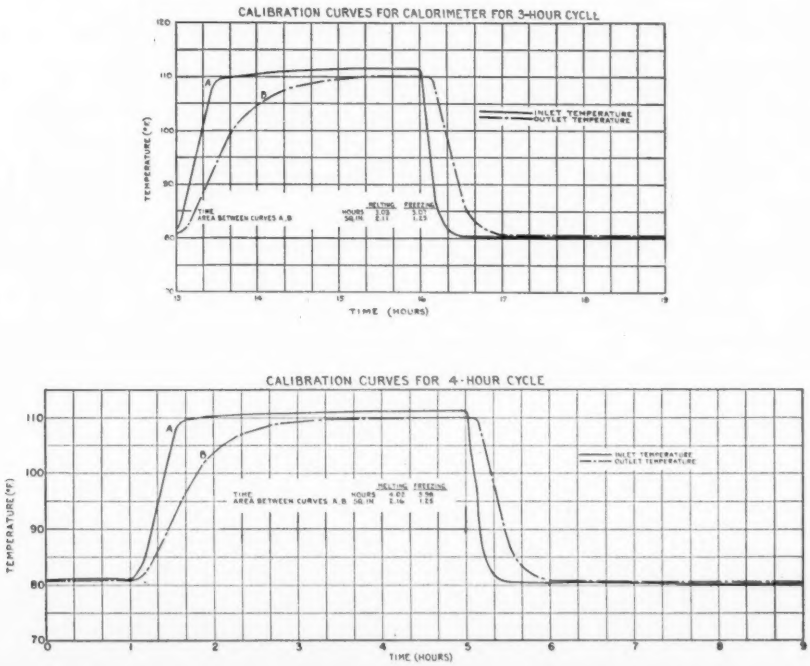

Fig. 4—Calorimeter Calibration Curves for 3- and 4-Hour Cycles.

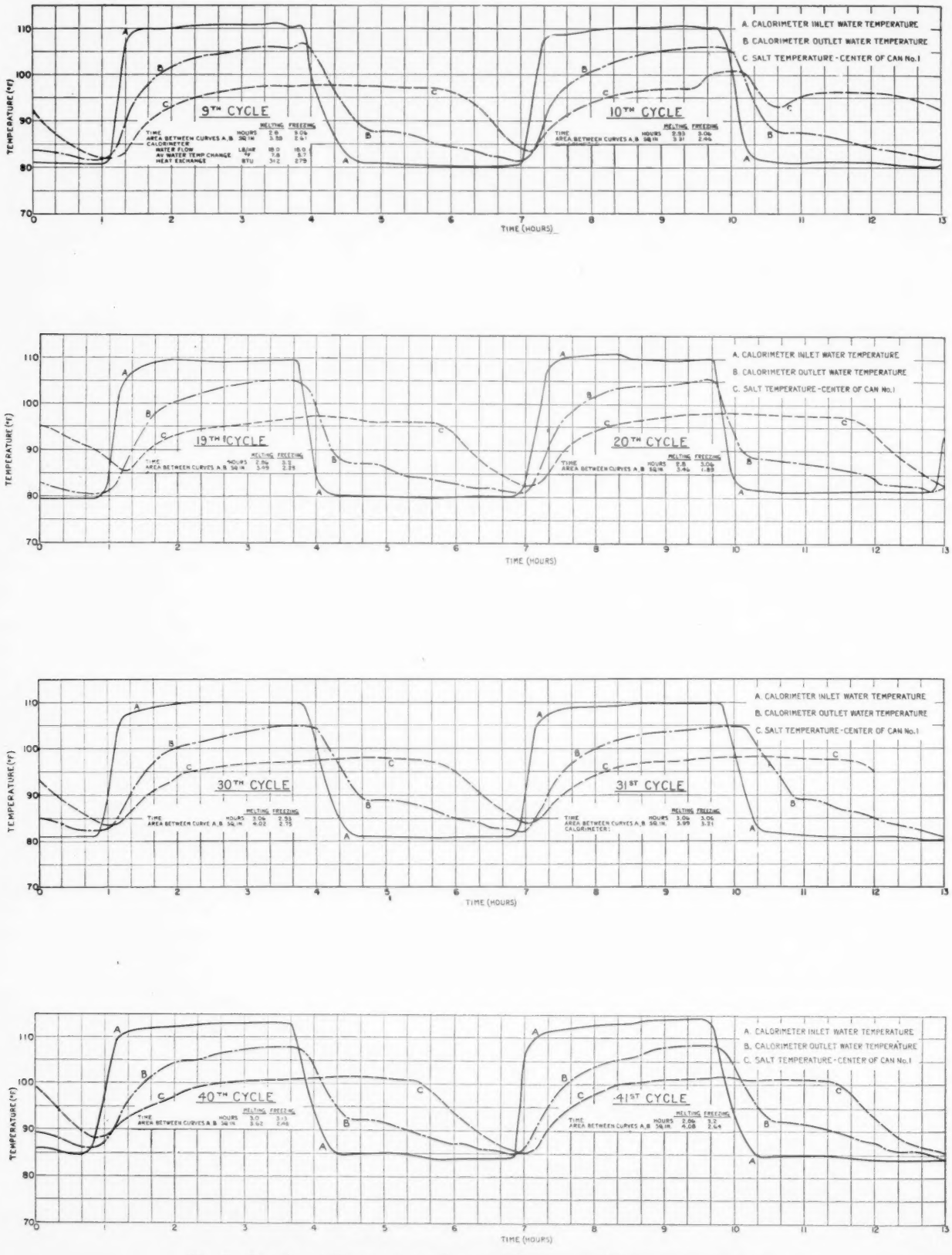

Fig. 5—Samples of Temperatures Recorded During the 100 Successive Cycles in the Test Period.

salt is shown in Figs. 5 and 6. The calorimeter inlet and outlet water temperatures and the salt temperature in the center of can no. 1 are given in these figures.

The heat exchange to and from the containers of salt is represented by the difference in area between the salt cycle and the calibration curves. A planimeter was used to obtain the area between curves "A" and "B" of each cycle. This area was multiplied by the equivalent Btu per sq in., which then represented the gross heat exchange for the cycle. The stand-by and warm-up losses, as given by the calibration curve and corrected for the difference in the leaving-water temperature, were subtracted from the gross heat exchange. In this manner it was possible to determine the amount of heat absorbed in each heating cycle and the amount of heat given up by the salt during each cooling cycle. A tabulation of the analysis during the melting and freezing cycles, for approximately every tenth cycle, is given in Table 1.

The heat exchange (represented by the area between curves "A" and "B") was not exactly the same for each cycle. The time of the cycle was increased from approximately 3 to 4 hr after the fifty-third cycle. The variation in the length of the cycle should not affect the accuracy of the results, since the actual area between curves "A" and "B" was used in the analysis.

The water flow through the calorimeter varied considerably throughout the test and is believed to be the largest contributing factor to the different values of the heat exchange in the salt obtained during the different cycles.

It is strongly suspected by the investigators that the salt did not always completely melt and crystallize during the first half of the test when the shorter cycle (3 hr) was used. An examination of the salt temperature curves at the center of the cans showed that no rise was evident at the end of the melting portion of the cycle. This rise would have occurred if the salt had completely melted due to the heat of fusion. It was for this reason that the length of the cycle was increased. It appears that during the longer cycle, complete melting and crystallization of the salt was realized in most cases.

Field Testing Program

Results of the laboratory investigations at Power, W. Va., appeared to be sufficient confirmation, concerning the pos-

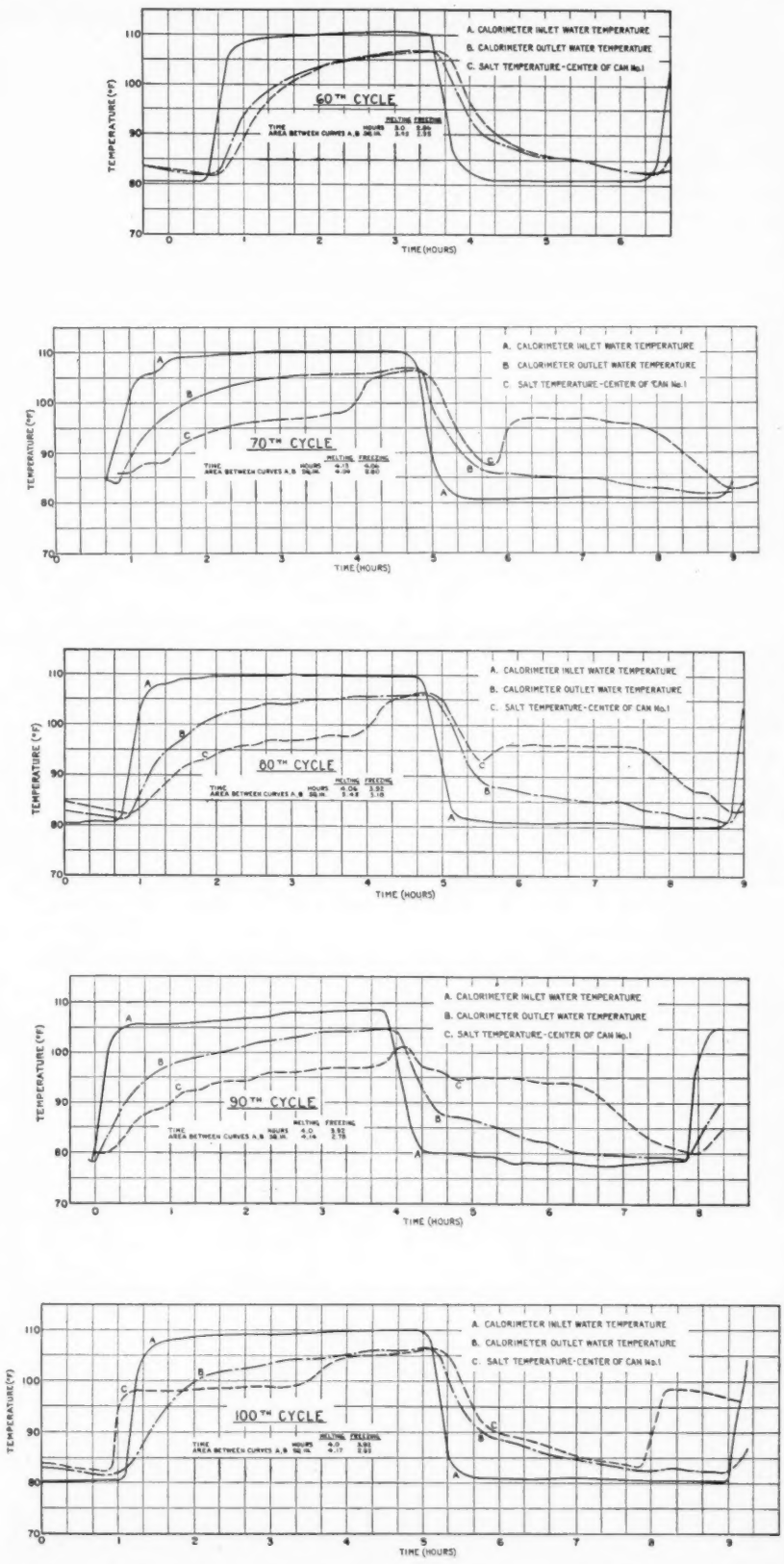

Fig. 6—Samples of Temperatures Recorded During the 100 Successive Cycles in the Test Period.

sible use of chemical heat storage, to warrant limited field tests in conjunction with operating heat-pump systems. Fifty thousand containers were prepared according to specifications of Dr. Telkes for use in at least eight field locations. It has been estimated that 6000 containers of the size used in the laboratory tests will have a storage capacity of approximately 300,000 Btu between temperature limits of 80-115 F. One method of utilization has been to use a standard 275-gal tank, of the type normally used for indoor storage of fuel oil, as a receptacle for the 6000 salt containers. Water as the heat-transfer medium is circulated through the tank in contact with the containers. For comparable water-heat-storage capacity between the same temperature limits, a 1200-gal tank would be required. Another method being tested in the field installations is placing the containers in the distribution air stream of an air-to-air heat-pump system, using the circulating air as the heat-transfer medium. It is of interest to note that two manufacturers of heat-pump equipment also have plans to make laboratory tests on this type of storage system in conjunction with their respective heat-pump models.

Report to be Published

Complete operating records of the test installations will be maintained by the committee and a report on operating characteristics of heat-pump systems using chemical-heat storage will be published as soon as sufficient information is available.

Although the committee is of the opinion that some sort of heat-storage system will be of definite advantage when used in conjunction with a heat pump, this report should not be construed as an endorsement of this type of heat storage as the answer to the problem. It is recognized that the progress to date is only a beginning and that additional investigations should be made.

The crystallization promoter in each of the test containers seemed to have performed satisfactorily in assuring recrystallization of the chemical during the cooling or heat-extraction cycles. It is believed, however, that further investigation is needed to find a more acceptable device which can be produced easily and economically. The promoters used in the laboratory tests were examined after 100 cycles and appeared to be undamaged. The laboratory tests were estimated to represent a normal service of about three to five years. In view of the apparent condition of the promoters following the tests and since no practical substitute was readily available, it was decided to use the same type in the field test installations.

The containers used in the tests and prepared for the field installations were 2⅛ in. by 2⅞ in., a standard size container readily available and not requiring special equipment for handling. It is believed that larger containers could possibly be used, which would decrease initial costs of packaging. Additional investigation with larger containers is required before evaluation of possible economies and storage characteristics can be made.

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TABLE I—ANALYSIS OF MELTING AND FREEZING CYCLES

Cycle No.	Total Cycle Hours	MELTING CYCLE							FREEZING CYCLE					
		Flow Lb/Hr	Area Sq. Inch	Stand-By and Warm-Up Heat Loss Btu	Gross Heat Exchange Btu	Salt Heat Exchange Btu	Theoretical Heat Exchange Btu	Actual Theoretical Per Cent	Area Sq. Inch	Stand-By and Warm-Up Heat Loss Btu	Gross Heat Exchange Btu	Salt Heat Exchange Btu	Theoretical Heat Exchange Btu	Actual Theoretical Per Cent
1	2.81	16.20	3.31	216	358	142	204	70	2.47	152	257	115	204	56
9	2.80	17.75	3.28	216	388	172	204	84	2.61	152	309	157	204	77
10	2.93	17.75	3.31	218	392	174	204	85	2.46	152	291	139	204	68
19	2.84	-	3.49	-	-	-	-	-	2.25	-	-	-	-	-
20	2.80	-	3.46	-	-	-	-	-	1.89	-	-	-	-	-
30	3.06	-	4.02	-	-	-	-	-	2.75	-	-	-	-	-
31	3.06	-	3.99	-	-	-	-	-	3.21	-	-	-	-	-
40	3.00	-	3.62	-	-	-	-	-	2.48	-	-	-	-	-
41	2.86	-	4.08	-	-	-	-	-	2.64	-	-	-	-	-
53	3.96	17.25	3.32	232	382	150	204	73	3.12	152	359	243	204	119
54	3.86	17.25	3.36	231	387	156	204	76	3.02	152	347	195	204	95
55	4.02	17.00	3.98	233	451	218	204	107	2.84	152	322	170	204	83
60	3.00	-	3.45	-	-	-	-	-	2.95	-	-	-	-	-
70	4.13	-	4.04	-	-	-	-	-	2.80	-	-	-	-	-
80	3.96	-	3.45	-	-	-	-	-	3.18	-	-	-	-	-
90	3.90	-	4.14	-	-	-	-	-	2.78	-	-	-	-	-
99	3.96	14.60	3.62	232	352	120	204	59	3.12	152	304	152	204	75
100	3.90	14.20	4.17	235	394	159	204	78	2.85	152	270	118	204	58
Average 18 Cycles	3.38	16.33	3.67	214	400	186		91	2.74		299	147		72

Note: Cycles 1 to 53, inclusive, and 60 - approximately 3 hours.
Cycles 53, 54, 55 and 70 to 100, inclusive - approximately 4 hours.

Swivel Chairs for Sale

(*Continued from page* 152)

basis of immediate sales per customer and per dealer. The attendance, in proportion to the potential, exceeded that of any national show of which I know.

As a stimulator for our representatives, we had a year-round cooking activity which included an "All-Electric Kitchen Club" incentive program. This provided for cash payments for any all-electric installations of 25 kw or more made during the year. The results of this activity were one all-electric kitchen in 1950 for every 100 food service customers, or a total of 47 all-electric kitchens installed in one year.

A Good Year

Yes, we had a good year. For our dealers, since we do not merchandise, it meant that a total of 54 pieces of equipment, valued at $7,200, was sold for every 100 food service customers. For the company, it meant, for every 100 food service customers, a total additional conected load of 210 kw, with an estimated annual revenue of $5,200.

To do this job with an average rate of 3.4 cents per kwh in a highly competitive field, it really meant getting off the swivel chairs—and that is why we say "swivel chairs for sale."

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TD-8—Suggestions for Specifications for Straight Tinned Copper Connectors (10/40)	.10	.10
TD-9—Specifications for Single Tube Seamless Copper Splicing Sleeves (10/42)	.10	.10
TD-10—Suggestions for Specifications for Rolled Steel Washers (5/40)	.10	.10
TD-11—Specifications for Guy Hooks and Guy Strain Plates, 1951	.10	.10
TD-12—Specifications for Pole Guards, 1946	.10	.10
TD-13—Specifications for Guy Thimbles, 1950	.10	.10
TD-15—Specifications for Pole and Lower Steps, 1946	.10	.10
TD16—Line Hardware Materials Inspection Procedure, 1950	.10	.10
TD-17—Specifications for Bolt Type Steel Insulator Pins with One Inch Diameter Lead Threads, 1947	.10	.10
TDJ-19—Standard Mounting Bracket for Distribution Cutouts and Distribution Lightning Arresters, 1949.	.10	.10
TD-22—Specifications for Pole Top Pins, 1951	.10	.10
TD-51—Specifications for Low and Medium Voltage Pin Type Lime-Glass Insulators (Supersedes TD-51, 1937 in part) 1942	.25	.25
TD-51—Suggestions for Specifications for Low and Medium Voltage Pin-Type Insulators, 1937	.25	.25
TD-71—Suggestions for Specifications for Insulator and Pin Threads and Gauges (5/37)	.10	.10
TD-72 — Tentative Specification for Line Connectors and Splices (1949)	.10	.10
TD-90—Specifications for Douglas Fir Crossarm Treated or Untreated, 1949	.10	.10
TD-91—Specifications for Dense Southern Pine Crossarms, Preservative Treated, 1950	.10	.10
TDJ-110—Standards for Distribution Fuse Links, EEI-NEMA, 1951	.15	.15
TDJ-131 — Standards for Filament Lamps Used in Street and Highway Lighting, EEI-NEMA, 1951	.10	.10
TDJ-132—Standards for Photometric Tests for Luminaires Used in Street and Highway Lighting, EEI-NEMA, 1951	.10	.10
TDJ-133—Standards for Voltage Classification of Luminaires Used in Street and Highway Lighting, EEI-NEMA, 1951	.10	.10
TDJ-134 — Standards for Pendant Luminaire Mounting Used in Street and Highway Lighting, EEI-NEMA, 1951	.10	.10
TDJ-136—Standards for Series Sockets and Series-Sockets Receptacles Used in Street and Highway Lighting, EEI-NEMA, 1951	.10	.10

Commercial Division Reports and Manuals

	Members	Non-Members
Agriculture		
51-14—Farm Wiring Demonstrations for Group Presentation, 1951 — 1—49 copies .50 ea. Quantity prices upon request.		
51-11—Farm Electrification Research, 1951	$1.00	$1.00
50-8 — Farm Electrical Equipment Handbook, 1950 — Single copy $2.25 postpaid. Quantity Prices Upon Request		
Farm Electrification Manual—Includes 14 Sections of original series excepting Section 3, which will be forwarded when revised, 1947	5.00	8.00
New Series — Sec. 15, Dairy Stable Ventilation, 1950	.40	.60
New Series — Sec. 16, Barn Cleaning, 1951	.30	.45
New Series—Sec. 17, Poultry House Ventilation, 1951	.25	.40
Quantity prices & prices of individual sections upon request		
General		
51-22—Electric Range Installation Manual, 1951	.50	.50
51-21—Electric Laundry Equipment Installation Manual, 1951	.35	.35
51-15—Study to Determine Load and Revenue Potential of American Food Market, 1951	.25	.25
51-12—Study to Determine Load and Revenue of Water Heater Market, 1951	.25	.25
50-5—Study to Determine Load and Revenue Potential of the American Restaurant, 1950	.25	.25
R-19—Catalogue of Sales Aids for Electric Industry, 1949	1.00	2.00
R-10—Study to Determine Load and Revenue Potential of American Drug Store, 1949	.25	.25
P-6—The Heat Pump (7/47)	.25	.25
Lighting		
R-18—Tabulation of Information Relating to Street Lighting As Obtained from Returns of 104 Public Utility Companies Throughout the U S, 1949	.40	.40
Power		
I-1—Power Sales Manual—Sections 1 to 10 and 12 to 17 and Supplements to Jan. 1, 1950 (Includes one Binder) Prices Upon Request		
Water Heating		
O-4—Model Specifications for the Installation of Wiring and Plumbing for Automatic Electric Storage Water Heaters	.25	.25

NATIONAL PROGRAMS

Better Light-Better Sight Bureau

"Teaching About Light and Sight"—Classroom program for teaching 5th and 6th grade students about light and sight. Price list upon request.

"Living with Light"—Classroom program for teaching Junior High School students about light and sight. Price list upon request.

"Light Is What You Make It"—A sound movie in technicolor produced by Disney Productions. 16mm, 10 minutes. Price list upon request.

"Let There Be Light"—Street lighting, sound slide film. 15 minutes, 75 frames 25.00

"See for Yourself"—Home lighting, sound slide film. 15 minutes, 105 frames 30.00

"Educating In a Truer Light"—School Lighting, colored sound slide film, 22 minutes—over 100 frames 50.00
Accompanying booklet 5.00 per 100

Planned Lighting Program

Series of mailers and booklets promoting planned lighting for stores, schools, offices, industries and homes. Price list upon request.

Sales Training Program

Four Courses Available—Basic, Residential, Commercial and Rural Prices Upon Request

Appliance Sales Training Course—6 Films and Records $250.00
Set of 6 Salesmen's Manuals for above course $4.50
Industrial Sales Training Handbook 18.50
Residential Lighting Film & Record 30.00
Residential Lighting Salesmen's Manual .75

Mother-Daughter Program

An electrical-living promotional program featuring a 27 minute color sound movie. Prices and details upon request.

OTHER PROMOTIONAL MATERIALS

Commercial Cooking

"Penny Folder"—"Invest One Cent in Electricity" $4.50 per 100

Data Sheets $2.00 for first set
.75 each for next 14 sets
.25 each additional set if sent to one address

Electric Water Systems Council

"Case of the Missing Heart" 16.00 per 1000 (minimum order)

"Produce More Food," Leaflet $34.50 per 1000 (minimum order)

	Members	Non-Members
Electrical Living		
EM-2—"Dreams Come True When You Live Electrically" 5.00 per 100 copies (minimum order—100)		
Home Service		
"Carefree Cooking Electrically" 14.00 per 100 (minimum order—100)		
R-4—"Make Home Economics Your Profession" 7.00 per 100 (minimum order—100)		
R-14—"Patterns for Parties" 10.00 per 100 (minimum order—100)		
EM-1—"Appliance Demonstrations" 2.50 per 50 copies (minimum order—50)		
EM-3—"Open the Door to Modern Homemaking Education" $7.00 per 100 copies		
Water Heating		
EM-4—"Go Electric When You Need Hot Water" 4.00 per 100 copies (minimum order—100)		
Wiring Booklets		
M-8—"Handbook of Farmstead Wiring Design"	.40	.40
Quantity prices upon request.		
M-7—"Handbook of Residential Wiring Design"	.25	.25
Quantity prices upon request.		
Wiring Films		
Commercial Rewiring—set of 45 Kodachrome, 2 x 2 slides and text 25.00 per set		
Extra copies of text 1.00 per copy		

Miscellaneous Publications

52-3—Report of the Industrial Development Subcommittee of EEI Rural & Urban Development Committee, 1952	.50	1.25
52-A—Report of Recreation & Travel Development Subcommittee of EEI Rural & Urban Development Committee, 1952	.25	.65
52-B—Report of Civic Development Subcommittee of EEI Rural & Urban Development Committee, 1952.	.25	.65
52-1—Interim Electric Power Survey, 1952	.30	.30
51-20—"I Want to Know About Elec. Industry" 1951-52 Edition — 2-99 copies $ .25 each Quantity prices upon request.		
51-18—Specifications for Impregnated Paper Insulated Cable, High Pressure Pipe Type—1st Edition, AEIC, 1951	Single Copy	$1.00
	10 or more	$ .85
51-4 — Specifications for Impregnated-Paper Insulated Lead-Covered Cable Oil-Filled Type, AEIC, 1951	Single copy	1.00
	10 or more	.85
50-14—"Protection of Electric Service from Sabotage and Enemy Action," 1950	Single copies	.20
Quantity prices upon request.		
50-7—Specifications for Alternating-Current Power Circuit Breakers (2nd Edition), AEIC, 1950	.60	.60
50-6—Principles for Sound Water Resources Development, 1950	$21.00 per thousand	
	3.00 per hundred	
R-17—Specifications for Impregnated Paper-Insulated, Lead-Covered Cable, "Solid" Type (8th Edition) AEIC, 1949	1.00	1.00
R-12—Electrical Metermen's Handbook—6th Edition—1950	Single copy	$3.30, 4.90
Quantity prices upon request.		
Q-13—"Take a Look at the Outlook"	.10	
Q-11—Suggested Field Test Procedure for Determination of Co-efficient of Performance Factor of an Electric Heat Pump While Operating on Heating Cycle, 1948	.25	.25
Q-5—Specifications for Impregnated Paper-Insulated Lead Covered Cable, "Low Pressure, Gas-Filled" Type—AEIC 1948	Single copies	$1.00
	10 or more "	.85
Objective Type Rates, 1933-1936	.80	2.00
Ice and Wind Loading Tables for Overhead Line Conductors (Revision of Tables 85 to 96 of the Overhead System Reference Book) 1942	1-4 copies	.10c.
	5-49 "	.6c.
Rate Book for 1950-51	20.00	30.00
Weekly, Monthly and Annual Statistics	2.00	2.00
(Includes Annual Statistical Bulletin; Weekly Electric Power Output; Monthly Electrical Research Statistics)		

Periodicals

Better Light—Better Sight News (6 issues yearly)	1.00	1.00
Edison Electric Institute Bulletin (Monthly)	2.00	2.00
Farm Electrification (a bi-monthly publication) Up to 10 copies	Free	
Over 10 copies	.75	1.00
Quantity prices upon request.		
Home Service Exchange Yearly subscription	1.00	1.50
One free copy to members upon request.		

PERSONALS

The New England Electric System has announced the appointment of ROBERT F. KRAUSE as President of New England Power Service Co. to replace EDWIN A. DOW, who has been named Chairman of the Board of Directors. Other appointments include WALTER P. O'NEIL as Vice President; EDWARD F. ZIEGLER as Vice President in charge of labor relations and personnel; and ALBERT CALVERT as Assistant Vice President and head of the rate department.

A graduate of the University of Arizona and the University of Michigan Law School, Mr. Krause became associated with the Public Utilities Division of the Securities and Exchange Commission in 1938, advancing during his ten years of service to associate director. He joined New England Power Service Co. in 1948 as a member of the corporate department and in 1950 became assistant to the president of New England Electric System.

Mr. O'Neil was employed in the engineering department of the New York, New Haven & Hartford Railroad from 1915 to 1929, when he joined New England Power Construction Co. as an engineering assistant. In 1938 he was appointed assistant engineer and in 1941, coordinating engineer, a position he will continue to fill in addition to his duties as vice president.

Mr. Ziegler began his utility career as senior engineer with the Duquesne Light Co. He transferred to New England in 1929 to become district engineer for the Service Company in Lawrence. In 1934 he was moved to Lowell as assistant to the district manager, becoming vice president of the Lowell company in 1943 and assistant district manager in 1948. Three years later he was appointed assistant vice president of New England Power Service Co. in charge of labor relations for system companies, a position which he will retain in addition to his new duties as vice president.

In other NEES organizational changes, RALPH E. SECORD, Vice President of Narragansett Electric Co., has been named Vice President of the Worcester County Electric Co.; ORIE VAN RYE, Assistant to the President; EDMOND F. LEACH, Assistant Vice President; and GEORGE V. KENNEDY, Assistant Vice President.

After graduating from the University of New Brunswick, Mr. Secord spent four years with Stone & Webster, Inc., before joining the sales department of the Quincy Electric Light and Power Co., of which he later became sales manager. In 1930 he transferred to Narragansett Electric as assistant superintendent of distribution, assuming the posts of superintendent of distribution in 1945 and vice president in 1947.

A native of Brielle, Netherlands, Mr. Van Rye began his utility career with Electric Bond and Share and later became assistant superintendent of distribution in Santiago, Cuba. He served as distribution engineer for Florida Power and Light, prior to joining New England Power Service Co. in 1929, where he served in various engineering capacities. In 1943 he was appointed director of labor relations at Boston, and in 1946 became personnel administration counsel.

THERON A. BROWN, Vice President and General Superintendent of the Madison Gas & Electric Co., has been elected President of the Wisconsin Utilities Association, succeeding E. H. COTTON, Vice President of the Northern States Power Co., who will automatically serve as Chairman of the General Advisory Committee under the new association administration.

GEORGE A. DONALD, President of the Lake Superior District Power Co., has been elected Vice President of the association, succeeding Mr. Brown, and HAROLD P. CHAMBERLIN, Assistant Secretary and Assistant Treasurer of the Wisconsin Electric Power Co., has been elected Treasurer of the association, succeeding IRVING P. STEYBE, Assistant Secretary and Assistant Treasurer of the Wisconsin Public Service Corp.

Installation of the newly-elected officers was conducted on May 15 at a dinner ceremony held in the Milwaukee Athletic Club, following the annual meeting of the Executive Committee of the association.

HAROLD C. LEONARD, Vice President of the Gulf States Utilities Co., has been elected President of the Southeastern Electric Exchange.

A graduate of Worcester Polytechnic Institute, Mr. Leonard joined Virginia Electric and Power Co. after a short period with Stone & Webster at Boston. He advanced to manager of Vepco's electric department at Norfolk in 1927, later becoming system electrical engineer. In 1930 he went to Texas as general superintendent of El Paso Electric Co.

Mr. Leonard joined Gulf States Utilities in 1935 as vice president and general manager in charge of the Louisiana Division. Shortly after, he became president of the Baton Rouge Electric Co., serving until 1938, when that company was merged with Gulf States. He then took over the position he now holds.

HOWARD H. MELVIN, formerly Executive Vice President of three Millville, N. J., public utilities, has been named a Vice President of Atlantic City Electric Co. coincidental with the acquisition of the Millville Electric Light Co. by the Atlantic City firm. With the purchase of the Millville property, Atlantic City Electric has added 6000 new customers to its lines, and JOHN L. DONNELL, also formerly connected with the Millville utilities, has been selected as Manager of Atlantic City Electric's affairs in Millville.

A graduate of Pierce School of Business Administration, Mr. Melvin has been a Director of the Atlantic City Electric Co. since January, 1951. He is active in industry, civic, and charitable organizations and is a past president and director of the New Jersey Utilities Association.

E. WALLACE WILKINSON has been elected Treasurer of West Penn Electric Co. to succeed J. LEE RICE, JR., who will continue to serve as Vice President and Director. A member of the New York State bar, Mr. Wilkinson joined West Penn in 1943 as tax accountant and attorney, and became assistant treasurer in 1947.

BUD S. MOSS has been named Manager of the Rural Division of the Georgia Power Co., with responsibility for rural electrification promotion as well as general agricultural activities. A graduate of the University of Georgia, Mr. Moss joined the company in 1946 as rural engineer and advanced to agricultural agent in 1948. He has been a member of the EEI Agricultural Committee for three years and is now serving as chairman of that committee.

CONVENTIONS AND MEETINGS

1952

MAY

5-7 EEI Accounting Division, Advisory and Managing Committee, Hershey Hotel, Hershey, Pa.
5-7 EEI-AEIC Meter and Service Committees, Edgewater Beach Hotel, Chicago, Ill.
6-7 EEI Transmission and Distribution Committee, Edgewater Beach Hotel, Chicago, Ill.
6-7 EEI Hydraulic Power Committee, Edgewater Beach Hotel, Chicago, Ill.
6-9 NEMA 4th International Lighting Exposition and Conference, Auditorium, Cleveland, Ohio.
7 ECAP Copy Group Meeting, Minneapolis, Minn.
7 EEI Commercial Electric Cooking Conference, Sheraton Hotel, Chicago, Ill.
7 EEI Commercial Lighting Committee, Cleveland, Ohio.
7-9 Northwest Electric Light and Power Association, Engineering and Operation Section, Rainbow Hotel, Great Falls, Mont.
8-9 PEA Relay Committee Spring Meeting, Lawrence Hotel, Erie, Pa.
8-9 PUAA Annual Convention, Hotel Radisson, Minneapolis, Minn.
8-10 Controllers Institute of America, Pacific Coast Conference, St. Francis Hotel, San Francisco, Calif.
9-10 Southeastern Electric Exchange Accounting Conference, Henry Grady Hotel, Atlanta, Ga.
11-14 EEI Purchasing and Stores Committee, Roosevelt Hotel, New Orleans, La.
12-13 EEI Power Station Chemistry Subcommittee of Prime Movers Committee, Sheraton-Cadillac Hotel, Detroit, Mich.
12-14 Northwest Electric Light and Power Association, Business Development Section, Chinook Hotel, Yakima, Wash.
14 ECAP Management Group, Hotel Biltmore, New York, N. Y.
14-15 National Industrial Conference Board 36th Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.
15-16 PEA Electrical Equipment Committee, Hotel Roosevelt, Pittsburgh, Pa.
15-16 EEI Dealer Coordination Workshop, Roosevelt Hotel, Pittsburgh, Pa.
19-21 Northwest Electric Light and Power Association, Personnel Section, Vancouver Hotel, Vancouver, B. C.
21-23 IES Regional Conference, Webster Hall Hotel, Pittsburgh, Pa.
22-23 Northwest Electric Light and Power Association, Accounting and Business Practice Section, Medford Hotel, Medford, Ore.
22-23 PEA Transmission and Distribution Committee, Irem Temple Country Club, Dallas, Tex.
22-23 EEI Accident Prevention Committee, Indianapolis Athletic Club, Indianapolis, Ind.
25-27 Controllers Institute of America, Midwestern Conference, Netherland Plaza Hotel, Cincinnati, Ohio.
28 PIP Mid-Atlantic Group, Rochester, N. Y.
28-29 PEA Prime Movers Committee Spring Meeting, Tidewater Inn, Easton, Md.

JUNE

2 PIP Steering Committee, Statler Hotel, Cleveland, Ohio.
2 EEI Industrial Relations Committee, in conjunction with EEI Annual Convention, Cleveland, Ohio.
2-4 EEI 20TH ANNUAL CONVENTION, Cleveland, Ohio.
6-7 1952 Annual South Dakota All-Electric Industry Conference, Alex Johnson Hotel, Rapid City, S. D.
8-12 National Association of Electrical Distributors, 44th Annual Convention, Atlantic City, N. J.
8-12 Canadian Gas Association Annual Meeting, Chateau Frontenac, Quebec, Que.

1952

JUNE

11-13 Pacific Coast Electrical Association Annual Convention, Hotel del Coronado, Coronado, Calif.
15-19 ASME Semi-Annual Meeting, Sheraton Gibson Hotel, Cincinnati, Ohio.
16-20 ASCE, Denver Convention, Denver, Colo.
19-20 IES Regional Conference, Hotel Preston, Swampscott, Mass.
19-30 ASME Applied Mechanics Division Conference, Pennsylvania State College, State College, Pa.
22-25 Michigan Electric Light Association, Annual Convention, Mackinac Island, Mich.
23-27 AIEE Summer General Meeting, Hotel Nicollet, Minneapolis, Minn.
23-27 American Society for Testing Materials, Annual Meeting, 50th Anniversary, Hotels Statler and New Yorker, New York, N. Y.
23-27 ASME Oil and Gas Power Division Conference, Hotel Statler, Buffalo, N. Y.
30-July 2 Canadian Electrical Association Annual Convention, Banff Springs Hotel, Banff, Alba.

AUGUST

19-22 AIEE Pacific General Meeting, Phoenix, Ariz.

SEPTEMBER

3-13 American Society of Civil Engineers, Centennial Celebration, Chicago, Ill.
5-6 Maryland Utilities Association, Cavalier Hotel, Virginia Beach, Va.
7-10 Rocky Mountain Electrical League Fall Convention, Colorado Hotel, Glenwood Springs, Colo.
8-11 ASME Fall Meeting, Sheraton Hotel, Chicago, Ill.
8-12 Illuminating Engineering Society National Technical Conference, Edgewater Beach Hotel, Chicago, Ill.
15-16 EEI Accident Prevention Committee, Sheraton Hotel, Rochester, N. Y.
18-19 PIP Annual Workshop Conference, Edgewater Beach Hotel, Chicago, Ill.
19-20 Public Utilities Association of the Virginias, Greenbrier Hotel, White Sulphur Springs, West Va.

OCTOBER

1-3 Wisconsin Utilities Association Convention of Technical and Sales Sections, Schroeder Hotel, Milwaukee, Wis.
5-8 Controllers Institute of America, Annual Meeting, Hotels Sheraton, Cadillac and Statler, Detroit, Mich.
6-7 EEI Prime Movers Committee, Roosevelt Hotel, St. Louis, Mo.
6-8 EEI-AEIC Joint Meeting, Meter and Service Committees, Mayflower Hotel, Washington, D. C.
13-14 EEI Electrical Equipment Committee, Roosevelt Hotel, New York, N. Y.
13-17 AIEE Fall General Meeting, New Orleans, La.
23-24 EEI Transmission and Distribution Committee, Hotel Adolphus, Dallas, Tex.
27-30 AGA Annual Convention, Atlantic City, N. J.
30-31 EEI-AGA Taxation Committee, Closed Meeting, Chalfonte Haddon Hall, Atlantic City, N. J.

NOVEMBER

10-13 NEMA Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J.
10-13 NARUC Annual Meeting, Little Rock, Ark.
17-19 EEI Industrial Relations Committee, Annual Fall Round Table Conference, Sheraton Hotel, St. Louis, Mo.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

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(Terms Expiring 1952)

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(Terms Expiring 1953)

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(Terms Expiring 1954)

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(Continued)

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Codes and Standards, D. C. LUCE.....Public Service Electric and Gas Co., Newark, N. J.
Electric Power Survey, W. L. CISLER.....The Detroit Edison Co., Detroit, Mich.
Financing and Investor Relations, H. H. SCAFF.....Ebasco Services Inc., New York, N. Y.
Industrial Relations, F. E. VERDIN.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Insurance, I. M. CARPENTER.....Ebasco Services Inc., New York, N. Y.
Legal, RALPH M. BESSE.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Membership, E. S. THOMPSON.....The West Penn Electric Co. (Inc.), New York, N. Y.
Prize Awards, G. E. WHITWELL.....Philadelphia Electric Co., Philadelphia, Pa.
Purchasing and Stores, R. L. LEACH.....Georgia Power Co., Atlanta, Ga.
Rate Research, HARRY I. MILLER.....Wisconsin Public Service Corp., Oshkosh, Wis.
Statistical, ELDRED H. SCOTT.....The Detroit Edison Co., Detroit, Mich.
Transportation, S. G. PAGE.....Duquesne Light Co., Pittsburgh, Pa.

WATERMARK